COTTON

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Number Eleven
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SEPTEMBER, 1920

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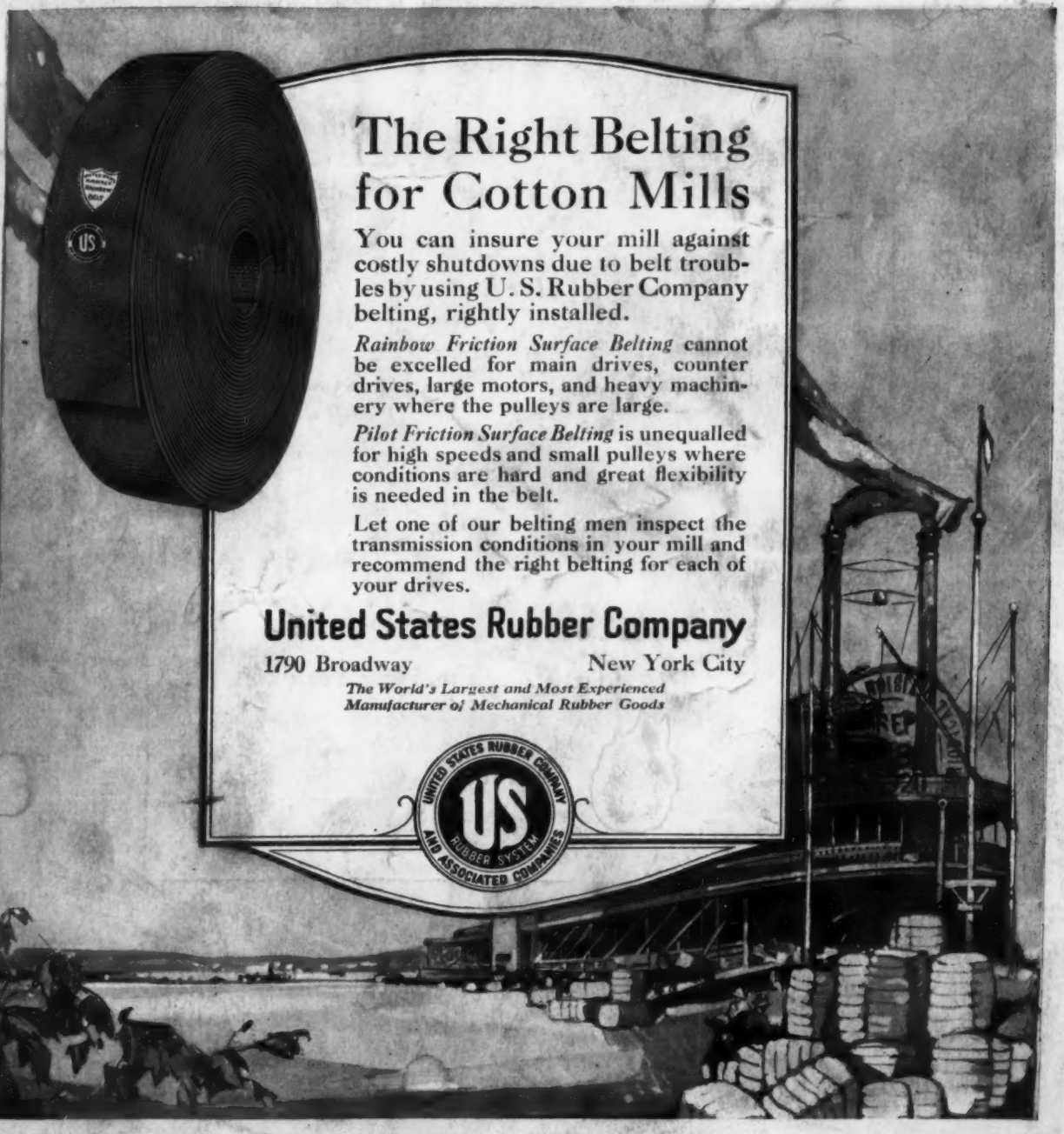
W. R. C. Smith Publishing Co.,
Dalton, and Atlanta, Ga.


The Right Belting for Cotton Mills
You can insure your mill against costly shutdowns due to belt troubles by using U. S. Rubber Company belting, rightly installed.
Rainbow Friction Surface Belting cannot be excelled for main drives, counter drives, large motors, and heavy machinery where the pulleys are large.
Pilot Friction Surface Belting is unequalled for high speeds and small pulleys where conditions are hard and great flexibility is needed in the belt.
Let one of our belting men inspect the transmission conditions in your mill and recommend the right belting for each of your drives.
United States Rubber Company
1790 Broadway New York City
The World's Largest and Most Experienced Manufacturer of Mechanical Rubber Goods
US
UNITED STATES RUBBER COMPANY
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

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PORCELAIN GUIDES

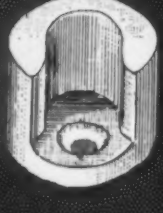
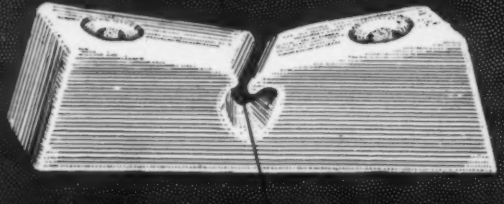
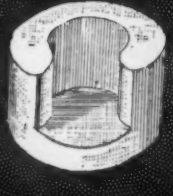
for

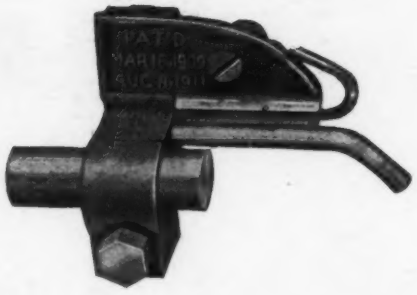
Textile Machinery

Mitchell-Bissell Co.

251-255 Fourth Avenue, New York

Send for
New Catalogue



Over 224000

MacColl Patent Spooler Guides

in use up to

July 1 1920

Adapted to both

Cotton and Worsted Yarns

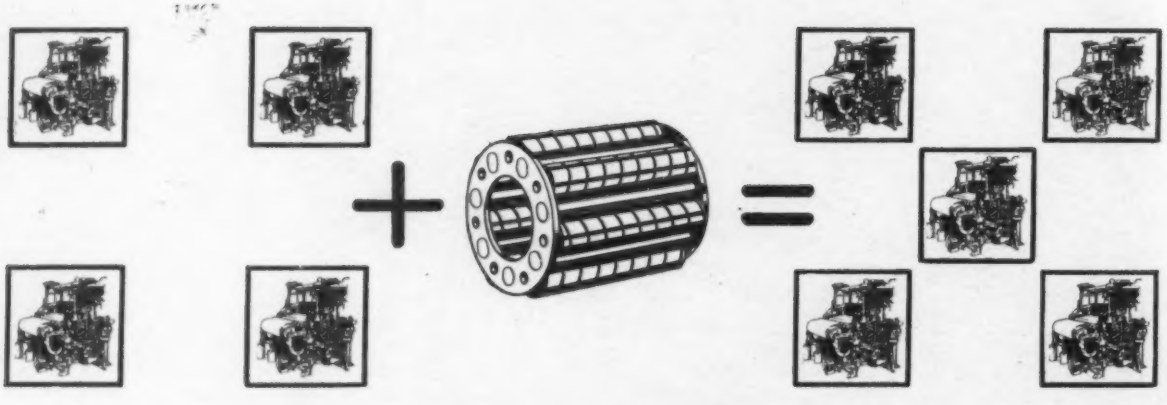
DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

Southern Office
188 South Forsyth Street Atlanta Georgia

Copyright 1917 by Draper Corporation

Question: When do 4 looms = 5 looms?



HYATT BEARINGS FOR

Answer:

Four looms equipped with Hyatt Roller Bearings will produce as much as five plain bearing looms.

Hyatt equipped looms **have** done this, **are** doing it now and **will** do the same for you.

The number of picks per minute on a Hyatt equipped loom can be increased without setting up destructive vibration because 50-75% of the bearing friction is eliminated.

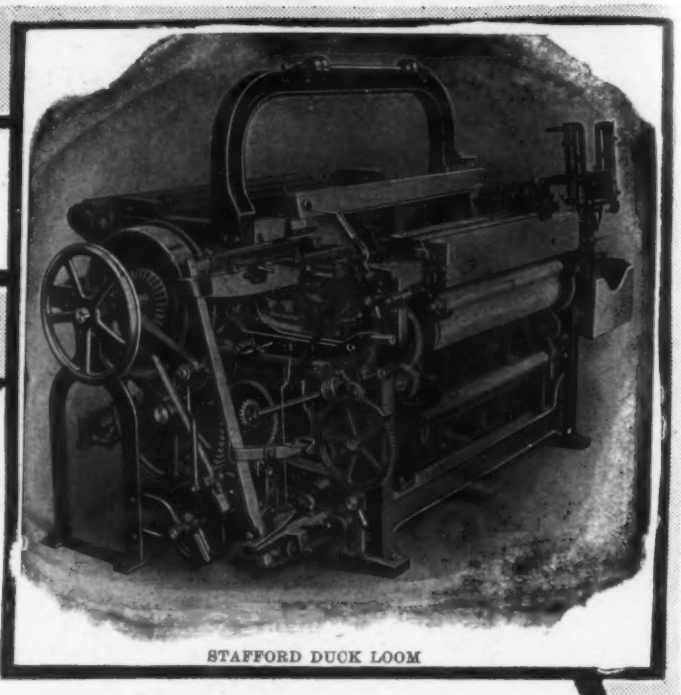
Specify that your looms be Hyatt equipped.

1966

HYATT ROLLER BEARING COMPANY
INDUSTRIAL BEARINGS DIVISION
NEW YORK, N. Y.

TEXTILE MACHINERY

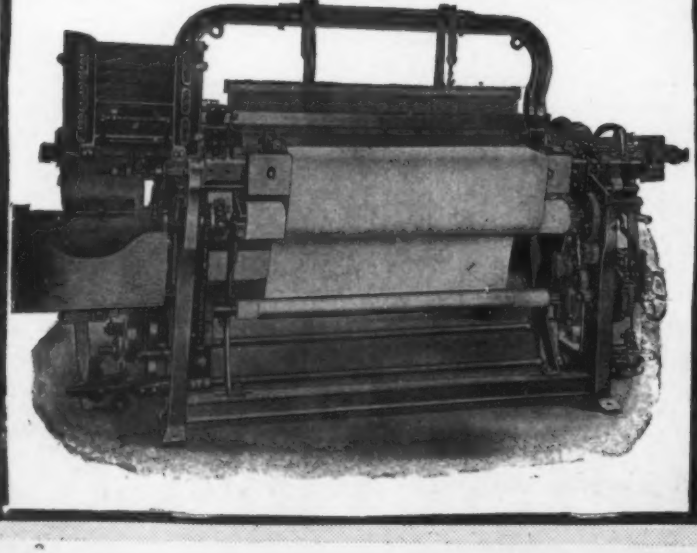
Dependable Looms



STAFFORD DUCK LOOM

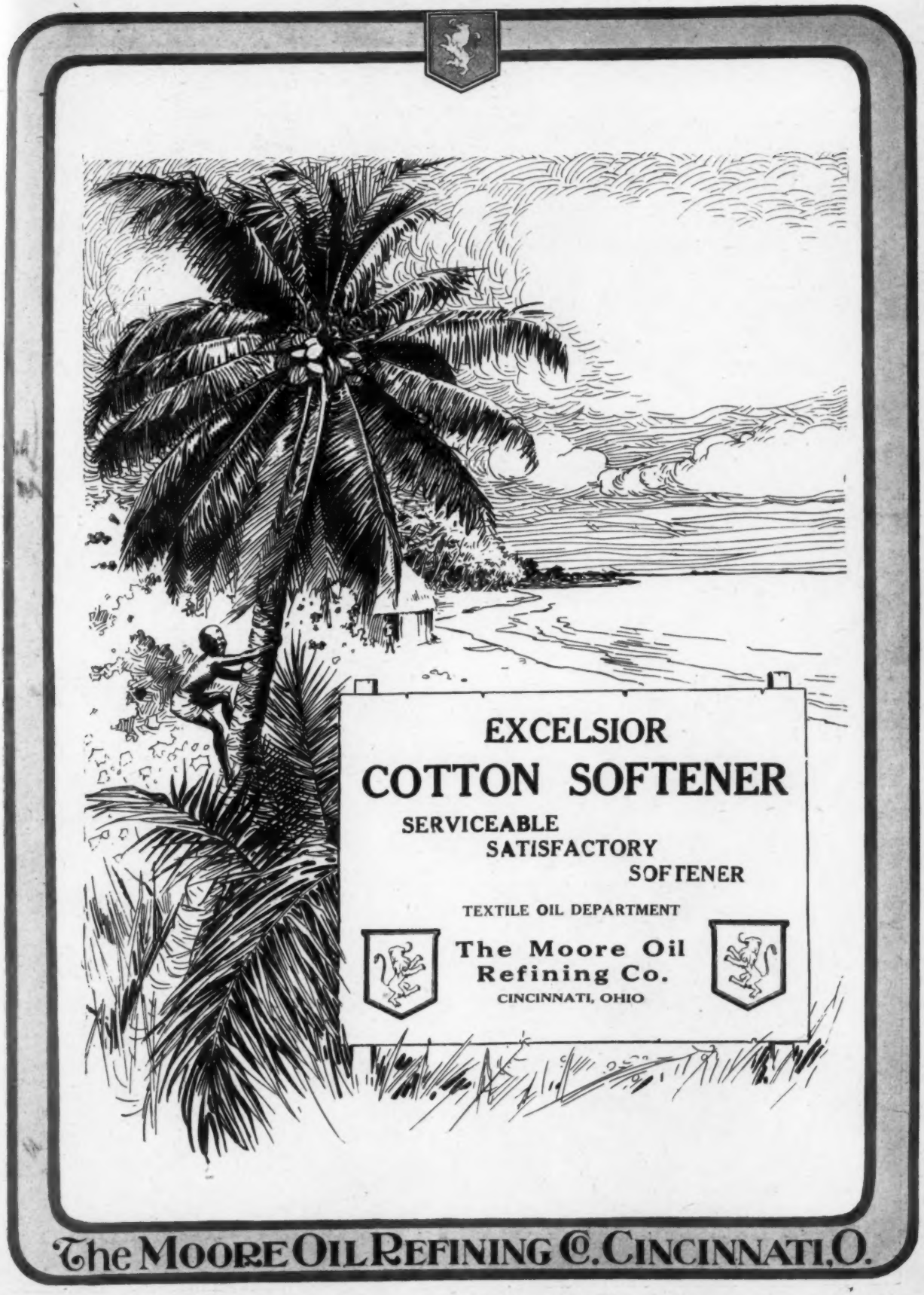
The Stafford Company has for a great many years concentrated on the production of a strictly practical loom. Convincing proof of the soundness of this idea is found in the large list of repeat orders for Stafford looms from a steadily growing list of progressive mills both in this country and Canada.

THE STAFFORD COMPANY

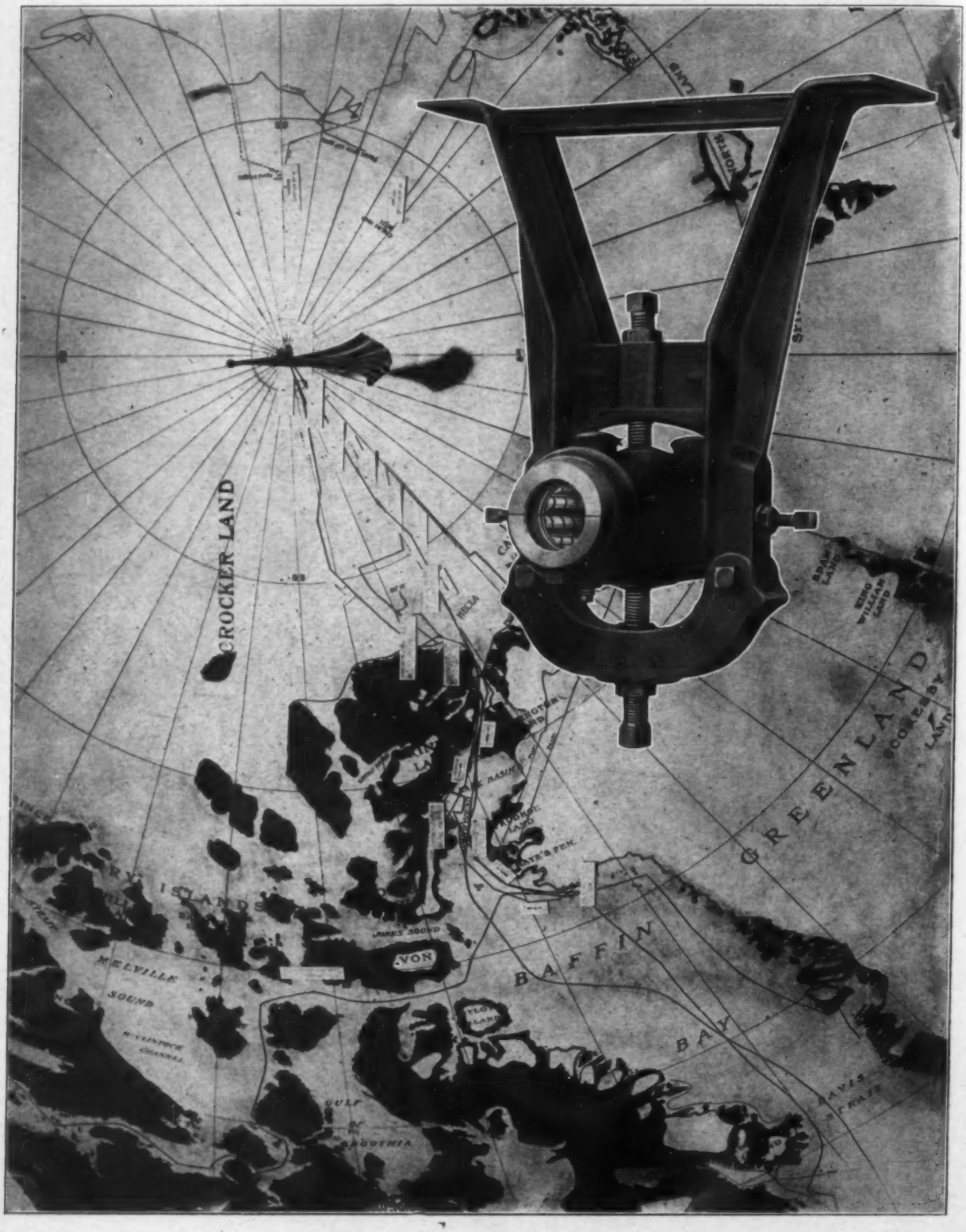


Readville
Mass.

Southern Agent
J. H. MAYES
Charlotte
N.C.


EXCELSIOR
COTTON SOFTENER
SERVICEABLE
SATISFACTORY
SOFTENER
TEXTILE OIL DEPARTMENT
The Moore Oil
Refining Co.
CINCINNATI, OHIO
The MOORE OIL REFINING Co. CINCINNATI, O.

WHY ARE HYATT ROLLER BEARING



HANGERS LIKE THE NORTH POLE?

THEY NEVER RUN HOT!

Hot-boxes, in plain bearing hangers, are due to rubbing friction and poor lubrication. They are the cause of many serious fires. Production is held up while the bearing is being re-babbitted or until the scored shafting can be replaced.

Hyatt Roller Bearing Hangers Never Run Hot.

They provide a true rolling motion instead of rubbing friction and are self-lubricating. The hollow rollers act as oil containers and distributors and retain a supply of oil on all bearing surfaces. Hyatt Roller Bearing Hangers need be lubricated but once every three or four months. Even though they were neglected and not oiled, they would not run hot.

If you are interested in preventing production losses due to hot-boxes, specify Hyatt Roller Bearing Hangers. Bulletin 125 gives complete information about them. Write for a copy at once.

D-173

HYATT ROLLER BEARING COMPANY
INDUSTRIAL BEARINGS DIVISION
NEW YORK, N. Y.

Manufacturers of Bearings for Mine Cars, Ore Cars, Steel Mill Cars, Roller Tables, Trolleys, Cranes, Hoists, Machine Tools, Line Shafts, Countershafts, Concrete Machinery, Textile Machinery, Conveyors, Lift Trucks, Industrial Trucks, Railway Service Cars, Storage Battery Locomotives, etc.

Motor Bearings Division
DETROIT, MICH.

Tractor Bearings Division
CHICAGO, ILL.

WHITIN MACHINE WORKS

ESTABLISHED 1831.

TEXTILE MACHINERY

Manufacturers of the Following Machines

COTTON MACHINERY

Opening
Conveying
Distributing
Picking
Revolving Flat Cards
Sliver Lap Machines
Ribbon Lap Machines
Combing Machines
Drawing Frames
Roving Frames
Spinning Frames
Spoolers
Twisters
Reels
Quillers

COTTON WASTE MACHINERY

COTTON AND WOOLEN SYSTEMS

Openers
Pickers
Willows
Card Feeds
Full Roller Cards
Condensers
Revolving Flat Cards
Derby Doublers
Roving Frames
Spinning Frames
Spoolers
Twisters

Special Spinning Frames

WOOLEN MACHINERY

Card Feeds
Full Roller Cards
Condensers
Wool Spinning Frames

WORSTED MACHINERY

Cone Roving Frames

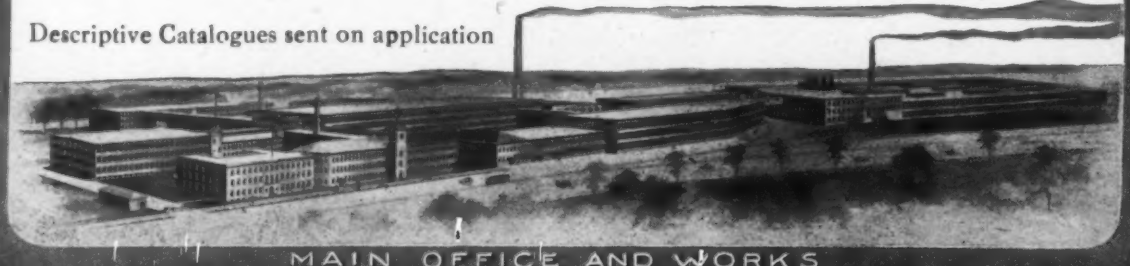
ALSO MAKERS OF

Rolls, Rings, Spindles, Flyers, and Hank Clocks

for All Makes of

Spinning, Twisting and Roving Frames

Descriptive Catalogues sent on application

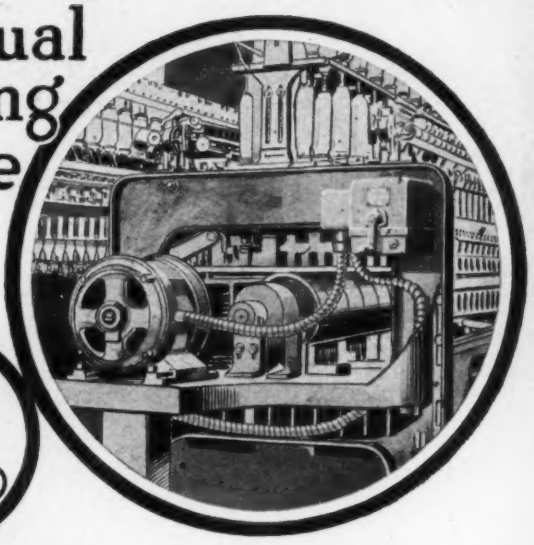


MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE, N.C.

Individual Spinning Drive



W
WESTINGHOUSE ELECTRIC

THATCHER SPINNING CO.

MFGS. OF FINE YARNS
CHATTANOOGA, TENN.

USE A LARGE NUMBER OF INDIVIDUAL SPINNING DRIVES

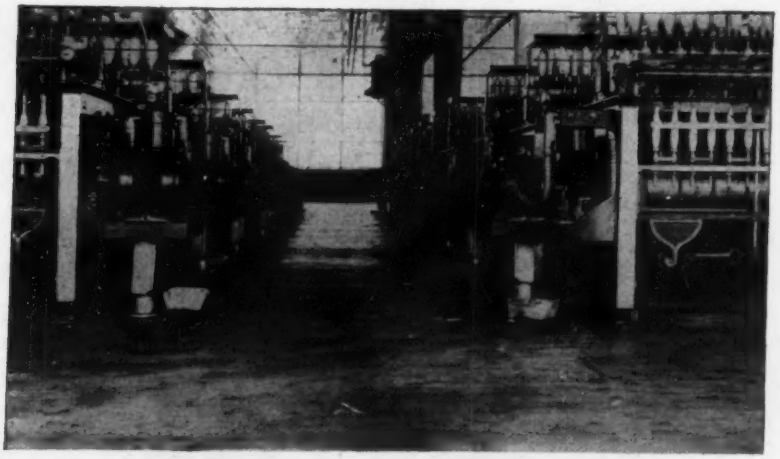
Like the many others who have installed Westinghouse Individual Spinning Equipment, The Thatcher Spinning Company has achieved these results:

1. A product of better quality.
2. A reduction in power expense.
3. Increased output.

The satisfaction experienced with Westinghouse Individual Spinning Drive is clearly indicated by the frequent repeat orders that have come from this and other customers.

The broad experience of Westinghouse Textile Power Experts is always available for the solution of your power problems.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.



Westinghouse

Sturtevant
PUTS AIR TO WORK

What is AIR CONDITIONING

AIR CONDITIONING is climate-making to order on a commercial scale, a scale regulated to the size of your business.
It provides heat, cold, a high percentage of moisture in the atmosphere, or its opposite in the exact degree required for maximum production.

It insures uniformity of temperature and humidity, independent of weather conditions.

It renders working and living conditions in the factory ideal,—that i the air is not only tempered, but is washed and cleaned—is freed of all fine lint thrown off by the machines, and is also purified of dust and dirt.

Air Conditioning is the road to results, the aid to production, the safeguard to quality, the important saver of time, the provider of health and satisfaction to the workers, the **efficiency producer,** unvarying in performance, which a score of different industries depend upon for increasing production and profits.

B. F. Sturtevant Company, for over sixty years specialists in Putting Air to Work, are originators, leaders, and largest producers in their field, which includes the production of Air-Conditioning Apparatus.

Sturtevant Multivane Fun Used in Air-Conditioning Systems

Send for the Booklet "Climate Doctors

This is the mark of the W. L. Fleisher engineering and construction organization of New York, who join their expert service with the Sturtevant high standard of design and construction, and who guarantee to you satifaction in the installation of air-couditioning systems.

B. F. STURTEVANT COMPANY

HYDE PARK, BOSTON, MASSACHUSETTS

AND ALL PRINCIPAL CITIES

Sturtevant
PUTS AIR TO WORK

Weather Profits
The Year 'Round

WHAT effect do varying weather conditions have on your loom-shed production? Is your production throughout the year as large as it should be—and would be? A

Sturtevant
(REG·U·S·PAT·OFF·)

Air-Conditioning System

can make weather profits for you every month in the year, by producing temperature and humidity as favorable to your maximum production and the quality of your product as **the best day's weather you ever had.**

Sturtevant Air-Conditioning

prevents static electricity, and thus the breaking and knotting of thread.

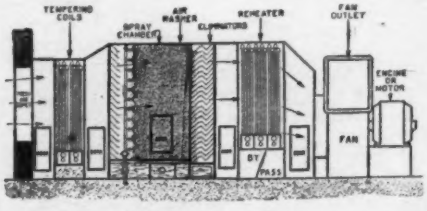
eliminates fly and fluff.

assures proper moisture-content (that is "weight") of the goods.

supplies a temperature of even warmth in winter and coolness in summer and humidified at all times, so that working conditions are always exactly as you would have them.

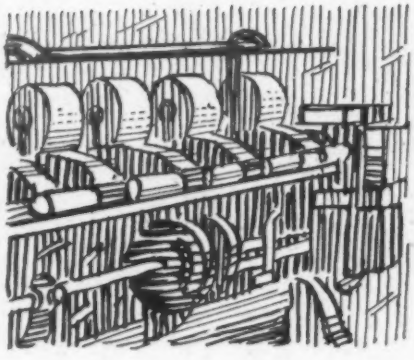
There is an interesting story of direct benefit to every textile manufacturer—"Climate Doctors." Send for it today.

This is the mark of the W. L. Fleischer engineering and construction organization of New York who join their expert service and the Sturtevant high standard of design and construction, and who guarantee to you satisfaction in the installation of air-conditioning systems.



Cross-Section View of Air-Conditioning System

B. F. STURTEVANT COMPANY
HYDE PARK, BOSTON, MASSACHUSETTS
AND ALL PRINCIPAL CITIES



The Place of HUMIDITY IN COTTON MANUFACTURING

No. 3. Combing

Combing is such a delicate operation, humidity, more than in previous steps — can and does aid the manufacture materially.

Moreover, on account of the high initial cost of the raw material, and finished product, humidity scientifically applied yields handsome returns.

Indeed without fair humidities — up to 60 or 65 per cent, accurately and uniformly regulated, even fair results in this very important quality operation are extremely difficult.

Humidity's place in this step is generally recognized. What is not so generally recognized is the necessity for fixed atmospheric conditions.

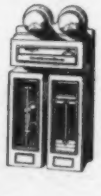
Profit by "High Duty Climate"

Parks-Cramer Company

Engineers & Contractors

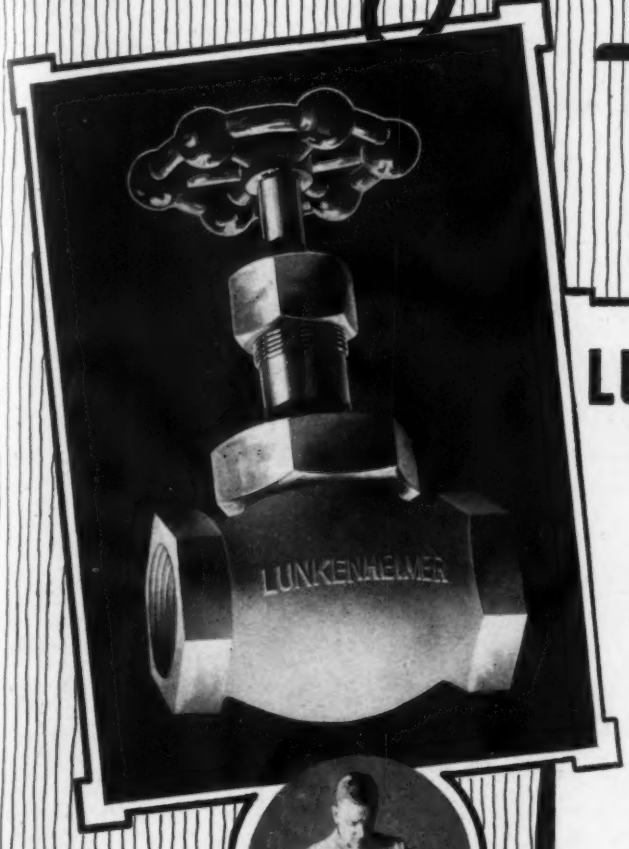
Industrial Piping and Air Conditioning

Fitchburg Boston Charlotte



Superiority—unfailing performance—service

AMERICA'S BEST
LUNKENHEIMER
"QUALITY"
SINCE 1862



The original Regrinding Valve

LUNKENHEIMER REGRINDING VALVES

have firmly established their unparalleled merit by the successful results they have given through many years of satisfactory service.

The metal to metal seat—ground to a tight fit, forms the ideal seating surface to resist the wearing action of steam at high velocity. And the fact that the seating surface can be reground (an inexpensive operation easily accomplished) makes the renewal of parts wholly unnecessary.

Their extreme durability due to correctly proportioned parts, high quality materials and expert workmanship insures economy in maintenance.

Globe, Angle and Cross Valves with Inside Screw and with Outside Screw and Yoke; and Horizontal, Angle, Vertical and Swing-Check Valves for 200 and 300 pounds workinm steam pressure.

Specify Lunkenheimer and insist on their installation. Distributors of Lunkenheimer Products situated in every commercial centre. **Write for descriptive booklet No. 517-AK.**

THE LUNKENHEIMER CO.
"QUALITY"

Largest Manufacturers of High Grade Engineering Specialties in the World

CINCINNATI

New York Chicago Boston London

3-21 10

Increased Wages—Welfare Work

Have They Solved Your Labor Problem?

¶ You, like other textile executives, are paying big increased salaries to your employees—have installed playgrounds, gymnasiums, libraries, and other welfare equipment—have put in new machinery and equipment—WHAT FOR? Of course with the idea of increasing production and attracting and retaining operatives and making them more contented.

¶ But has all this accomplished the end or brought the results that you wanted?

¶ Probably not, for the majority of executives are awakening to the realization that no matter what they do, the results won't materialize—that they are paying out more and getting less. They are asking themselves "What do they want"—"How can we give it to them?"

¶ A raise in wages that is not appreciated by the operative cannot be constructive—and it is not appreciated if they feel like the increase is simply what is due them. Before they can appreciate a raise they must understand the reasons for giving it to them and the obligations it places them under. The same with welfare improvements and other improvements about the mill and mill village. The mind of each operative goes through a process of thought, daily, that is very seldom contributive to contentment and increased production. But he is human, and his petty jealousies and ideas that might seem selfish and bigoted and one-sided to you, are just misunderstandings—misunderstandings that you cannot fight against BECAUSE YOU DO NOT KNOW HIS MIND—misunderstandings that you will probably never know about under your present conditions—but they exist and are working toward discontentment and decreased production continually.

¶ Textile executives, superintendents, overseers, efficiency experts—all fuss and worry, guess and figure, simply because they do not understand why their operatives do not step-according-to-Hoyle and appreciate their efforts as they think they ought to. There's something missing and that something is the lack of **knowledge of the cause for wrong thoughts**—in short the lack of psychology.

¶ You have to get "under their skin"—you have to know their minds and the workings of their minds—but the way to do it is the big question. There are plenty of impractical ideas, but an impractical plan carried out may do much more harm than good.

¶ There's only one **right** way, and that's where Sherman Service entered industry to stay.

SHERMAN SERVICE INC.

Production Engineering
Industrial Co-ordination

New York 2 Rector St.	Chicago 208 So. La Salle	Philadelphia 1211 Chestnut St.	Boston 10 State St.	St. Louis 314 No. Broadway
Cleveland Park Building	Detroit 73 State St.	New Haven 42 Church St.	Providence 10 Weybosset St.	Toronto 10 Adelaide St., East

Largest organization of its kind in the world.
Founded April 7, 1910.

SHERMAN SERVICE

A Shermanized Mill

Means Satisfied Executives and Operatives

¶ Increased wages and more welfare work may do some temporary good, but they won't solve the problem. A sedative may allay the irritation, but it takes a remedy and the right remedy to **cure** the trouble. The root of the trouble must be found.

¶ Sherman Service grew from a little to a great big institution almost in spite of itself. Demands were made upon it which were hard to meet but gradually and phenomenally it accepted the responsibility placed and MADE GOOD.

¶ **We deal solely in viewpoints.** We get at the root of the trouble, into the minds of the operatives and employers alike, study their thoughts and acts, find out why they think and do things contrary to contentment and production and change their viewpoint into proper channels for production purposes.

¶ It is through rubbing elbows, by word of mouth, by simple questions and answers at the right time and in the right place that accomplishes the necessary understanding—and it is with **human-principles,** based on **human-motives** and followed up with **human-acts** that turns that understanding into prosperous production and contentment.

¶ Sherman Service may be called "production engineering—industrial co-ordination" but it is really the humanization of all the component parts of industrial relationship—it handles, deals, in, corrects and constructs the human viewpoints of employer and employee alike. Its ways and means are understandable, above-board and mutually profitable. When you allow Sherman Service to enter your mill, you simply allow commonsense to reign supreme.

¶ If you carried out every plan you ever thought of or heard of, you would still lack the big experience and knowledge that we possess—knowledge gained through our experience with every phase of the question. For over ten years Sherman Service has not only been securing viewpoints and ideas, but in just the same manner have been correcting them. For every constructive word heard a constructive suggestion has been offered. Its experiences have been pooled, culled, studied and worked over and put into practice. We have a great group of human beings of every clime, type and vocation who have all gone through the Sherman School.

¶ We survey and analyze, counsel and advise—you and your ways first, and if we find your ideas are wrong we correct you. We get you right first, and then sell you to your operatives, get their viewpoints, and get everybody on their toes, thinking right, doing right. Then the mill works well and profitably.

¶ All our experience, all our knowledge and activities can be swung directly into your plant among your own operatives. Let us tell you the rest confidentially. Write today.

SHERMAN SERVICE INC.

Production Engineering
Industrial Co-ordination

New York	Chicago	Philadelphia	Boston	St. Louis
2 Rector St.	208 So. La Salle	1211 Chestnut St.	10 State St.	314 No. Broadway
Cleveland	Detroit	New Haven	Providence	Toronto
Park Building	73 State St.	42 Church St.	10 Weybosset St.	10 Adelaide St. East

Largest organization of its kind in the world.
Founded April 7, 1910.

SHERMAN SERVICE

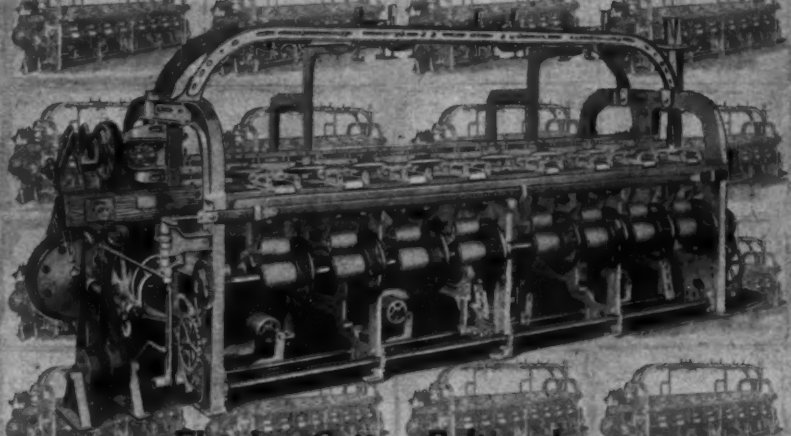
The officers and directors of Southern Textile Exposition, Inc., desire to express their appreciation of the many applications for space which have been received for the Fourth Exposition at Greenville, South Carolina, October 18th to 23rd. Except on the balcony floor all of the space has been sold. For instance, every loom manufacturer in the United States will be represented.

Greenville will accommodate all visitors comfortably in private homes when the hotels overflow. Application for these reservations must be made in advance

Greenville Association of Commerce will arrange entertainments complimentary to Southern Textile Association and the Exhibitors.

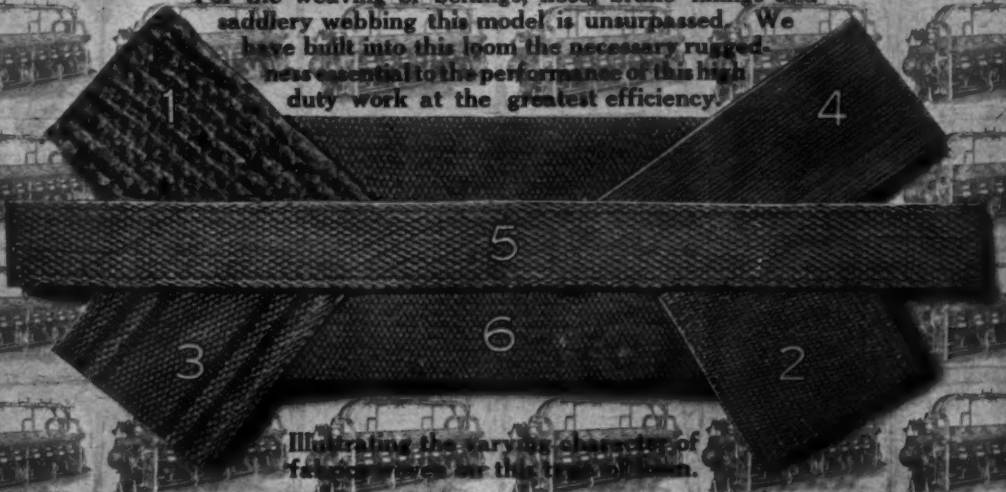
You are cordially invited to be present.

Southern Textile Exposition, Inc.
Greenville, South Carolina



Fletcher Cotton Belting Loom

For the weaving of beltings, hose, brake linings and saddlery webbing this model is unsurpassed. We have built into this loom the necessary ruggedness essential to the performance of this high duty work at the greatest efficiency.



Illustrating the carrying character of fabrics woven on this type of loom.

Character of Fabric

1. Asbestos Brake Lining
2. Woven Cotton Hose
3. Saddlery Webbing
4. Cotton Belting
5. Ford Cotton Brake Lining
6. Woven Cotton Fire Hose

Capacities

Belting and Hose

1 piece up to 24 inches wide
2 pieces up to 8 inches wide
4 pieces up to 4 inches wide
6 pieces up to 2 inches wide

Brake Lining

4 pieces up to 6 inches wide
6 pieces up to 4 inches wide
8 pieces up to 3 inches wide
10 pieces up to 2 inches wide

Manufactured by

FLETCHER WORKS

Formerly SCHAUM & UHLINGER

Glenwood Avenue and Second Street Philadelphia, U. S. A.

SACO-LOWELL CARD STRIPPER

DUSTLESS AND AUTOMATIC

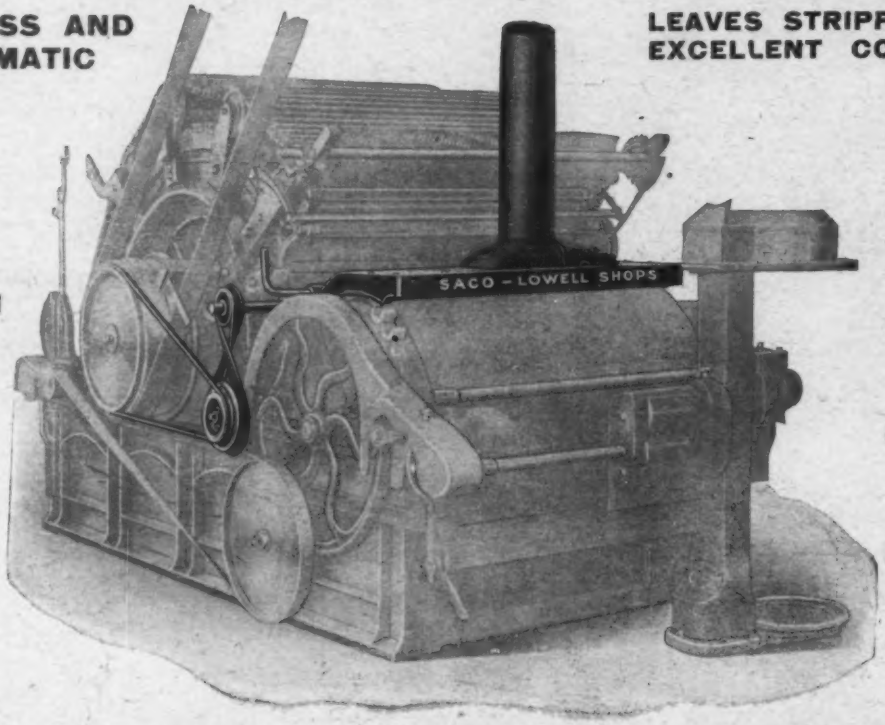
LEAVES STRIPPINGS IN EXCELLENT CONDITION

Economical to Operate

Saves Time and Labor

Strips Card Clean

Sanitary and Efficient



Low Cost of Maintenance

Simple, Durable Practical

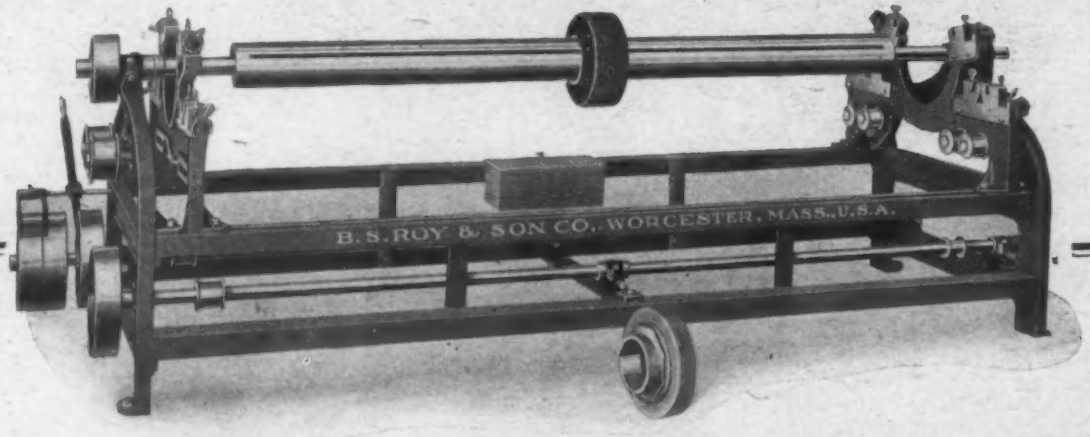
Control Always Absolute

Full Information Furnished

Rogers W. Davis, Southern Agent CHARLOTTE, N. C.

Saco-Lowell Shops, Newton Upper Falls, Mass.

Southern Branch Office GREENVILLE, S. C.



Are Your Card Clothing, Nappers and Garnetts in Good Condition?

Many textile mills all over the country have installed Roy Grinders and have that happy, satisfied feeling that their carding and napping machinery is always kept in the best of condition. Roy Grinders are an insurance protecting you against loss due to dull rolls.

Tell us your needs and let us suggest the Roy Grinder or Grinders that will meet them.

WRITE FOR BULLETINS

B. S. ROY & SON CO., Worcester, Mass.

Established 1868

E. M. TERRYBERRY, Southern Agent, c/o Howard Bros. Mfg. Co., 1126 Healy Bldg, Atlanta, Ga.

View of Textile Section, Lawrence, Mass.

AMERICAN BLOWER COMPANY

DETROIT, MICHIGAN

Let us lead you to the mill where yarns don't break or snarl.

Let delay, worry and endless knotting vanish for your mill girls.

See them pick up that swift, lightning-fingered technique that makes the big day's run.

Imagine the inspectors with nothing to do - the cloth that is perfect yard after yard - the skimpy pile of knit "seconds" - the costly cotton, wool and silk that is safely worked up into "firsts," where it can really earn a return to the mill.

The "ABC" Engineers want to lead you to this mill--your own mill.

The right ventilating, heating and humidifying equipment is magic medicine for fibers or yarns.

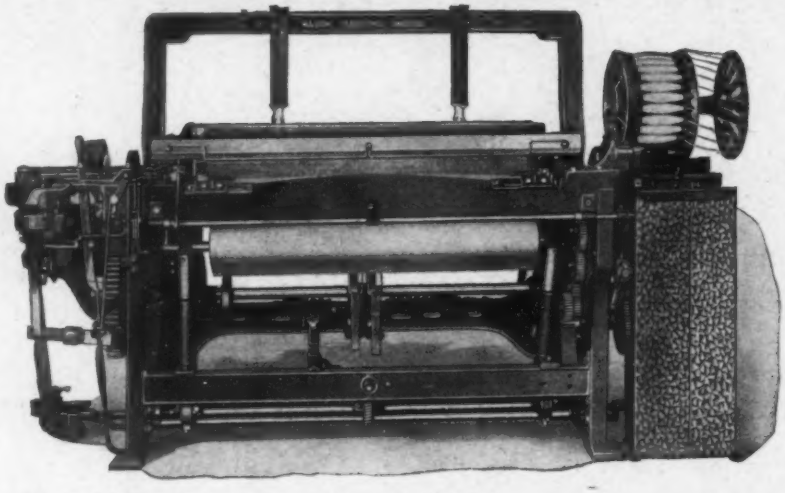
No more eternal trouble with floss and fiber that is too limp, too brittle, too curly, too loose, or that is fuzzed up or glued into a mess with static.

Whether it's the semi-raw spinning processes or the finished fabric that your mill makes, "ABC" Equipment stops the drudgery of labor on snarls and broken yarns.

Get what labor you can and keep it. Reduce labor turnover. Have new labor reach full technique and efficiency. Keep machines running. Save raw material. Reduce seconds. Increase "firsts" and increase output. "ABC" Equipment will do this for your mill, and now is the time as never before that your mill should be equipped or improved. Why not investigate? It costs nothing to learn our experience.

Sincerely yours,

AMERICAN BLOWER COMPANY



MASON AUTOMATIC LOOM

With Battery, Warp Stop Motion, Feeler and Shuttle Lock
RANDOLPH CROMPTON'S PATENTS

Fewer Parts Standard Construction Rebounding Shuttles Overcome
Damage to Shuttles and Bobbins Overcome

Mason Machine Works **Taunton, Mass.**

E. HOWARD, Southern Agent, Greenville, S. C.

THE SIMPLEST AND THE MOST ELABORATE

FABRICS

Are produced on

LOOMS

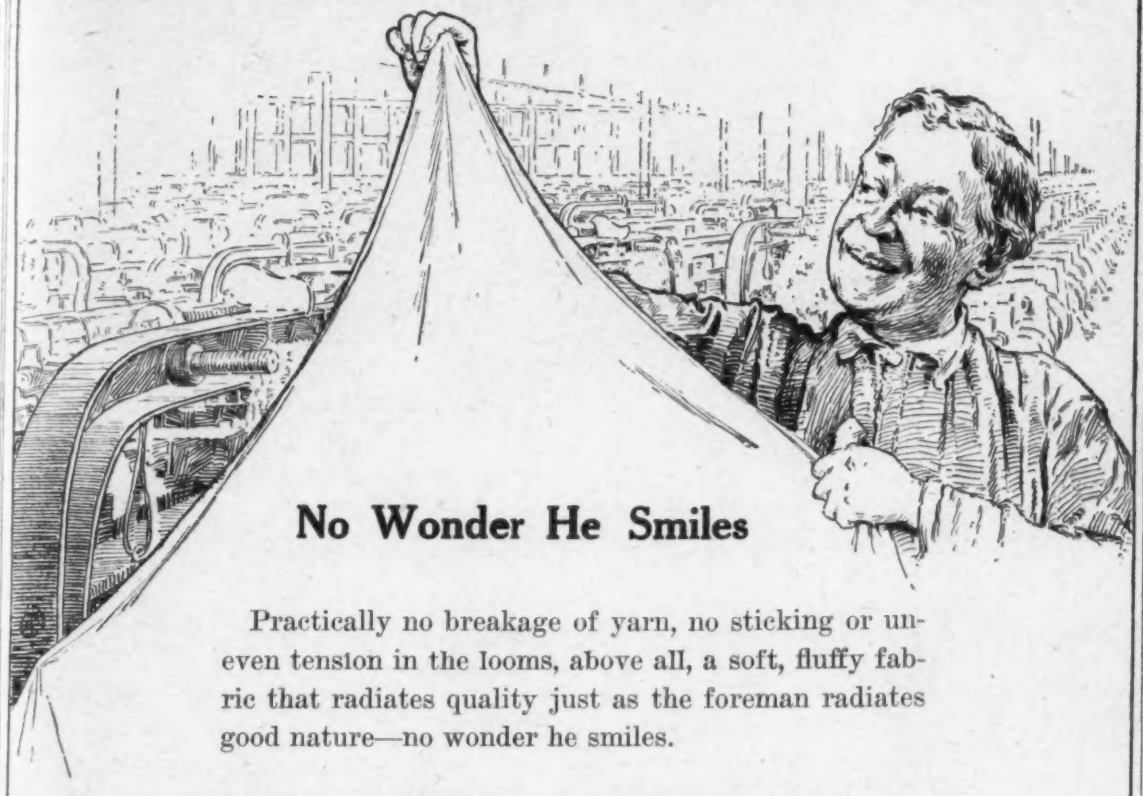
From the

Crompton & Knowles Loom Works

WORCESTER, MASS.

Providence, R. I. Paterson, N. J. Philadelphia, Pa.

Alexander & Garsed, Southern Representative, Charlotte, N. C.



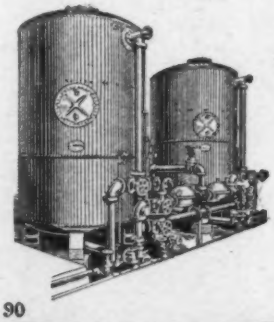
No Wonder He Smiles

Practically no breakage of yarn, no sticking or uneven tension in the looms, above all, a soft, fluffy fabric that radiates quality just as the foreman radiates good nature—no wonder he smiles.

A Permutit Water Softener brought about this result.

By removing all hardness and all harmful mineral impurities from the water, it has enabled this mill to produce, with economy and absolute dependability, a quality and texture of fabric never before achieved. It has eliminated absolutely all scale from boilers and kiers, and it has saved one shovel full of coal out of every four, besides soaps and supplies in profitable quantities.

Hundreds of mills are profiting by the economies and improvements from their Permutit Equipment. Let us solve your problems too—no cost, no obligation to you—write today.



The Permutit Company
440 Fourth Ave. New York
Offices in all principal cities

90

How Your Mill Village Laundry Will Increase Your Production---

WITH a mill village laundry, you can ADD the working days which you have had to DEDUCT owing to the fact that your workers have been compelled to stay at home and do their washing and ironing. Figures prove that about 300 days' labor is lost each week in the average mill—that's 15,600 DAYS THAT CAN BE SAVED EACH YEAR!

Install a mill village laundry and do the work AT COST—handle **all the washing**—household pieces as well as coats, aprons and uniforms. But be sure to arrange to IDENTIFY everything, so that nothing will be lost or misplaced. Our "National" equipment **insures** the return to each worker of EVERY PIECE **handled in your mill village laundry.**

Illustration Shows Our Improved No. 8 National Power Marking Machine

which marks all articles neatly and indelibly. Write us **TODAY**—we will advise you regarding a Mill Village Laundry.

National Marking Inks—best for all marking purposes.

TEXTILE DEPARTMENT OF

The National Marking Machine Co.

1068 Gilbert Ave. **General Offices** **Cincinnati, O.**

New York Office: 40-44 West Fourth St., New York City.

Boston Office: 100 Boylston St., Room 722, Colonial Bldg.

Chicago Office: 707-8 Cambridge Bldg., 160 N. Wells St.

Philadelphia Office: 125 N. 10th St.

TUEC
STATIONARY CLEANERS
TRADE MARK REGISTERED

Better Than Fans and Blowers

Made in 5 sizes to meet any requirement.

IN many textile mills and factories where formerly fans and blowers were used to protect workers from flying lint, dust and dirt produced by machines

The Tuec Suction Cleaner

has proved far more efficient and satisfactory. Instead of scattering dust and lint the TUEC *consumes* it and deposits it directly in its tank.

If you are using a fan or blower in your mill, if your janitors are wasting hours and dollars for the want of a Suction Cleaning Plant for floor cleaning and the removal of lint and dust from machinery, it will surely pay you to investigate and learn what the Tuec is doing for others.

Tuec Stationary Suction Cleaners are used everywhere—in cotton mills, textile mills, plants for the manufacture of electrical apparatus, coal pulverizing, Portland cement and rubber goods plants, wire mills, carpet mills, cereal mills, powder mills, paper box and wood working plants, printing plants, machine shops, laboratories and scores of others.

Our advisory service is complete and reliable. Write for catalog.

The United Electric Company - Canton, Ohio

New York Chicago Cleveland Toronto, Ont

It Gets the Dirt Where Dusters, Brooms and Brushes Fail.

HELP *your* HELP

and they will satisfy you

Provide Proper Recreation

---billiards and bowling
a clean sport

To exercise RIGHTLY *Means To PLAY!*

Bowling is the sport where you can PLAY and EXERCISE any old time —and regardless of the weather.

Let us Advise and Assist YOU in Providing

Recreation

that will
Keep YOU and YOUR EMPLOYEES
Physically Fit

Write for full information.

The Brunswick-Balke-Collender Co.

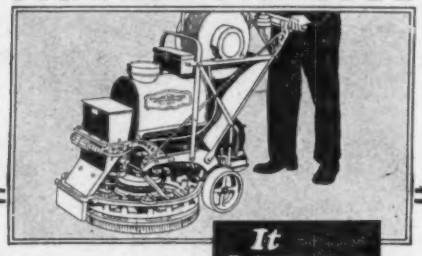
623-633 South Wabash Avenue
CHICAGO, ILLINOIS

Branches in All Cities

BILLIARDS AND BOWLING

"CLEAN FLOORS
Reflect Clean Business"

FINNELL SCRUBBER



It
SCRUBS
Electrically!

The Production Value of

CLEAN FLOORS

in American Business

RIVERSIDE AND DAN RIVER COTTON MILLS, INC.
Danville, Virginia
Where CLEAN FLOORS are helping to produce a CLEAN product under CLEAN conditions.

Well-informed executives know that happy workers are profitable producers. They know, too, that CLEAN, pleasant environment helps to keep workers healthy and happy.

The U. S. Department of Labor, in Bulletin No. 249, says, "Cleanliness and good order contribute to increased output as well as to discipline and morale of the factory."

The Metropolitan Life Insurance Company, in a booklet, entitled, "The Health of the Worker," says, "The bad conditions that exist in factories . . . keep the worker uncomfortable, they hinder his work . . . They are likewise harmful to the employer's interests, for he is a constant loser from poor and careless work, spoiled stock . . ."

Fortunately, executives are rapidly proving to themselves that cleanliness is essential to better production. They are learning that even the *floors* must be CLEAN—not just swept, mopped or hand-scrubbed with soda and water.

The Finnell System of Power Scrubbing, installed in a great variety of business institutions, is paving the way to greater efficiency by providing *really* CLEAN FLOORS.

For complete information, address inquiries to our Chicago offices.

AMERICAN SCRUBBING EQUIPMENT CO.

Also manufacturers of Finola Scouring Powder

General Offices: 188 N. Wabash Ave., Chicago Factories: Hannibal, Mo.

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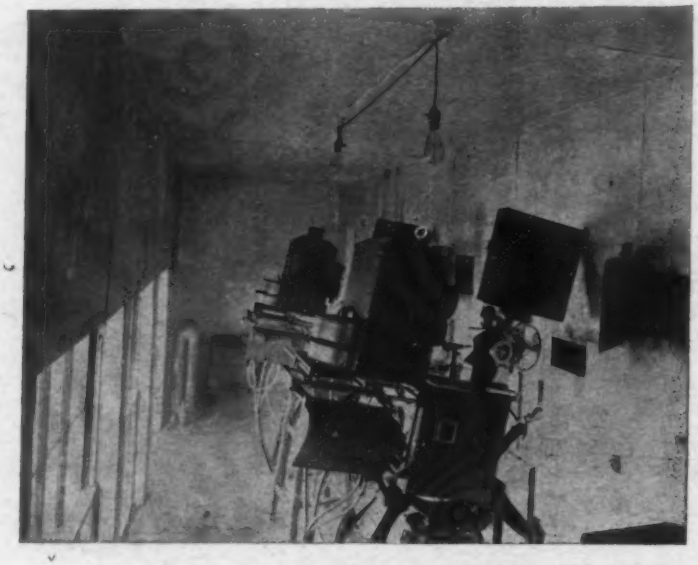
FINNELL SYSTEM

OF POWER SCRUBBING



Showing Installation of Power's 6 B Motion Picture Machines in the Tucapau Mills Theatre

The Textile Industry Demands the Best

That is why—

More Power's Projectors are used by Cotton Mills in the South than all Other Projectors combined.

"We Have a Special Offer"

Our experience in Theatre equipment is at your service

Southern Theatre Equipment Company

No. Nine Nassau St.
ATLANTA, GEORGIA

Eighteen Fifteen Main St.
DALLAS, TEXAS

"Dat sho' am a handy baby, Boss"

"Yas, suh, I don't need no nigger helping me when I use dat Handy Andy truck, cause, Boss. dat baby jus nachelly lifts dem heavy bales by itself, and it lifts 'em without gettin underneath 'em too. Why Boss, I can load fifteen hunnard pounds on dat truck without any help and do it quicker dan I usta could with dem old style trucks with two niggers helping me."

The HANDY ANDY ONE MAN TRUCKS are no experiments but are being used in some of the largest plants in this country. Their success is due to their simple strong features that can be found in no other truck. It is a one man truck and lever on wheels. It lifts the package without getting under it. It can be used in cramped places and with the boxes or packages against the walls. No helpers needed. One man and the Handy Andy handles the heaviest packages.

Let us tell you about the many features of this time and labor saving little truck, and the secrets of how it accomplishes its work so easily.

Handy Equipment Corporation

PEORIA, ILLINOIS.

J. KIRK ROWELL CO., Dist. Mgr.

716 Atlanta Trust Bldg., Atlanta, Ga.

HANDY ANDY ONE MAN TRUCK

HANDY EQUIPMENT CORP.

PAT. PEND.

Type B With Movable Axle

BACK POSITION

FRONT POSITION

This Truck goes out with the Load

Our illustrated catalog, "The One-Man Method" will answer your particular trucking problem. Send us your name and address and we will forward you a copy of this interesting booklet.

Here's more power to the transportation section.

Boxes, barrels and bales must be moved from the floor to the motor truck. And later moved again from the truck to the receiving point. Are your men handicapped with their present equipment? Are stops too long—deliveries too slow?

The McKinney One-Man Truck Service speeds up the moving of merchandise and slows down the expense. The McKinney One-Man Truck and just one man are needed to move any article on the floor. This truck is loader, bale-hook and helper all in one.

And its service doesn't stop in your shipping department. It can go right along with the load and serve at the other end. In the McKinney Truck the driver has the steadiest, surest helper on your payroll. This truck is more necessary to the motor carrier than a spare. When he drives up to his destination, he gets the load off in a jiffy. No straining, sticking, bumping or banging. The McKinney One-Man Truck is virtually a portable conveyor.

And so easy to operate! McKinney One-Man Trucks are of light construction yet rugged enough to conquer the heaviest load you handle.

If you think the overhead in your trucking department could stand a little trimming, information on the McKinney Truck will open your eyes. This information with the facts pinned down will reach you with dispatch.

McKINNEY MANUFACTURING CO.
Pittsburgh

Export Representation

THE LOVINGOOD COMPANY
Atlanta, Ga.

Also manufacturers of McKinney Hinges and Butts, garage and farm building door-hardware and furniture hardware.

McKINNEY *one-man* TRUCKS

ELWELL PARKER TRUCK & TRACTOR

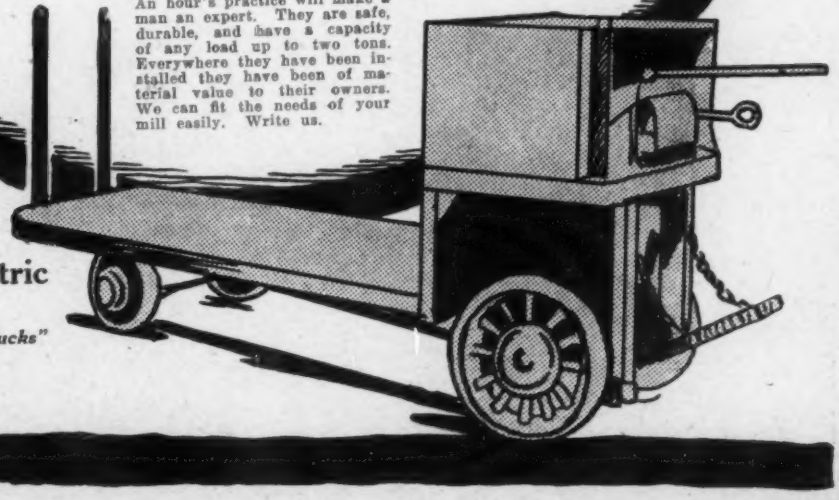
One man, an Elwell-Parker Truck, and you have ten times the quantity at twice the speed that was available under the old system of hand trucks. You save the cost of a large number of extra laborers formerly required, releasing needed men for work at other points in your plant.

PARKER TRUCKS SPELL ECONOMY—

Regularity, and economy are two highly essential requirements in the maintenance of factory work with the lightest possible overhead. In figuring this out experts will tell you, the least overhead is to be found where modern, up-to-the-minute equipment is utilized. Thousands of industries use Elwell-Parker Trucks in the receiving room, the shipping room, between departments at the loading and unloading platforms and in the boiler room. WHY? Because it is ECONOMY.

Keeping every part of the plant in constant operation by supplying it with needed raw material is an essential of industrial economy. It is expensive to have to wait for materials and keep a machine standing idle as well as its operator. There are no delays like this if Elwell-Parker Trucks are at hand to make needed deliveries. You should have Elwell-Parker Trucks.

The design of our trucks makes them easy to operate. An hour's practice will make a man an expert. They are safe, durable, and have a capacity of any load up to two tons. Everywhere they have been installed they have been of material value to their owners. We can fit the needs of your mill easily. Write us.



The Elwell-Parker Electric Company

"Pioneer Builder of Electric Industrial Trucks"

CLEVELAND, OHIO

Offices in all Principal Cities

Here's a Way

of getting plenty of "action" in moving goods and materials throughout your plant. You can cut your handling costs and secure greater production with fewer men by using these labor savers for your hauling—

Industrial Trucks and Tractors

powered with

Edison Storage Batteries

The Long-lived, *steel* and *iron* Edison Storage Battery with an *alkaline* (non-acid) solution is a sure guarantee that your Trucks and Tractors will make good and give dependable service the greatest number of work days per year with minimum up-keep.

It will pay you to investigate Storage Battery Truck and Tractor haulage as a time, money and labor saver.

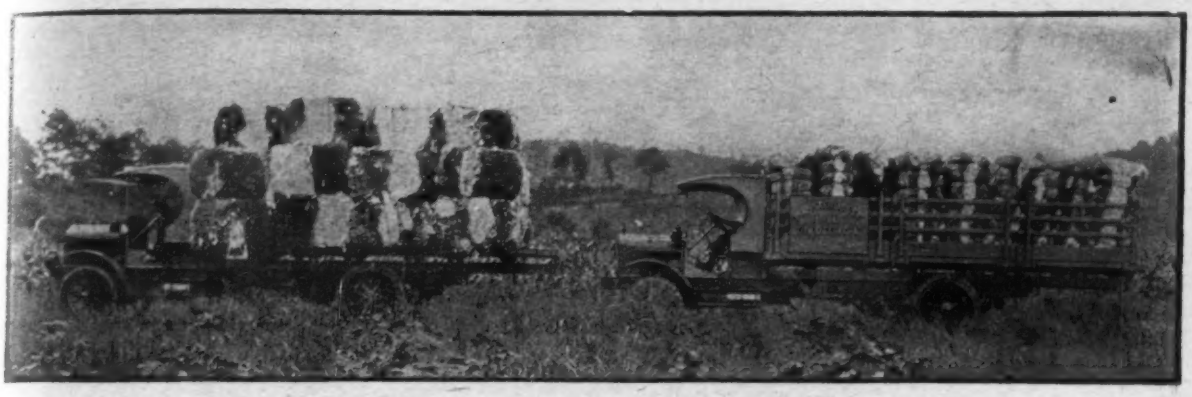
Before you forget, write for *your* copy of Bulletin 600-A-D—NOW.

Edison Storage Battery Co.

FACTORY AND MAIN OFFICE: ORANGE, N. J.

Distributors in

New York, Boston, Chicago, Buffalo, Cleveland, Detroit, St. Louis, Seattle, Los Angeles, Denver, Kansas City, San Francisco, New Orleans, Atlanta, Washington, Pittsburgh, Scranton, New Haven, Philadelphia.



Part of fleet of four White Trucks owned by Massachusetts Mills, Lindale, Georgia

PAY *for* THEMSELVES *in* SAVINGS

WHEN the Government assumed control of the railroads and trebled switching charges for moving cars of cotton from Rome, Georgia, to the plant of the Massachusetts Mills at Lindale, White Trucks were purchased to take over this work. The volume of expense saved can be realized from the fact that the mills use 40,000 bales of cotton annually.

"We are now operating three White Trucks of 5-ton and one of ¾-ton capacity," says Audrey Marshall, superintendent. "They paid for themselves during the time the increased switching charges remained in force.

"We use our trucks for hauling bales of cotton, dye-stuffs, and other materials within the plant site and from railroad sidings nearby; for transporting finished cloth from the mills to shipping points; hauling miscellaneous supplies from Rome to the mills, and for general trucking work in and about the plant. They have always given and are now giving satisfactory and economical service."

White Trucks are known for their ability to keep going day after day, year after year. They do the most work for the least money.

THE WHITE COMPANY
CLEVELAND

White Trucks

New England Winters make little difference to this hard working Packard Truck. The ease and ability with which a Packard handles heavy, bulky loads have made it the choice of many a Textile manufacturer who has heavy bales of raw and finished products to haul

How Does Transportation Authority Benefit the Truck Owner

TODAY the truck owner has a choice of two methods when selecting his trucking equipment.

Either he can buy his truck by "rule of thumb," trusting to luck that it will meet his requirements—or he can go to transportation experts who will select the right truck for his individual job.

The Packard engineers represent transportation authority. An authority backed by years of trucking experience, and over 9,000 monthly operating records, of trucks in all lines of business.

They can assure the truck owner not only a saving in hauling costs but a truck fitted to the actual work it has to do.

Each size of Packard Truck is designed as a unit around its engine as a basis.

Rear-end, clutch, gears—each size the proper design for its own engine.

Packard unity of design overcoming that common difficulty—an engine too big for the rear-end; or driving mechanism too heavy for the engine.

Another reason why Packard Trucks handle loads more economically per hundred pounds of truck.

Packard engineering considers operating economy more vital than cheapening production in the factory.

Low transportation costs shown by Packard Trucks—dependable performance—long life—all matters of record.

These records and the Packard's 44 definite factors of superiority (details available at local Packard headquarters) will keenly interest the truck owner.

They will give him a positive idea of how Packard's transportation experts have helped men in all lines of business increase their profits by reducing their trucking costs.

We have prepared an interesting booklet on motor hauling of coal. Sent on request by nearest Packard Distributor.

"Ask the Man Who Owns One"

PACKARD MOTOR CAR COMPANY, *Detroit*

IN the bearings sponsored by **SKF** its type of anti-friction bearings have been developed to their highest perfection. And **SKF** further provides an engineering service not only to assure to itself proper application and use of **SKF** products but to help the buyer to fully capitalize the mechanical value built into each device. This service is freely offered and is being continually broadened and advanced by laboratory research that is international in scope. You are assured a similar service behind every product bearing the mark—

SKF

Among the **SKF** *products now offered are:*

Single row deep groove ball bearings.
Double row self aligning ball bearings.
Steel balls.
Transmission equipment.

SKF Industries, Inc.
165 Broadway, New York City

Supervising at the request of the stockholders
The Hess-Bright Manufacturing Co.
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Atlas Ball Co.
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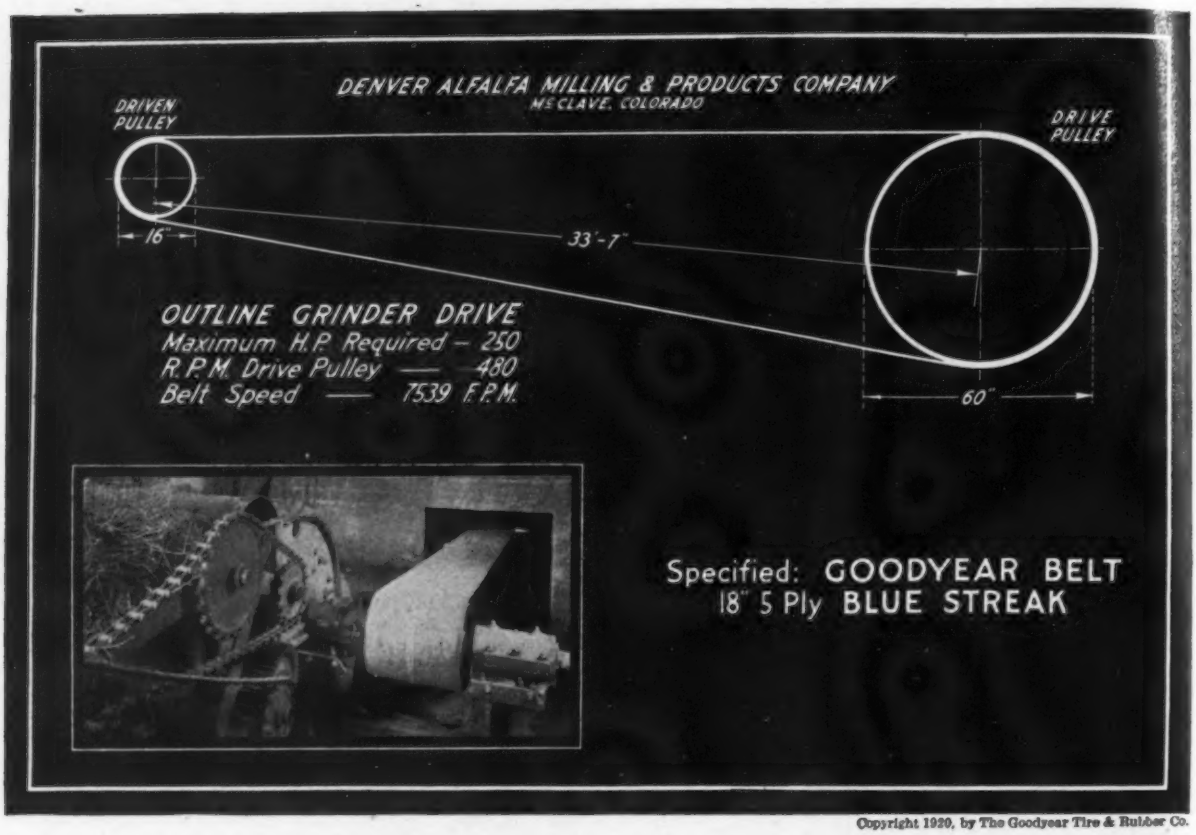
SKF Research Laboratories

***SKF** Research Laboratory established at Philadelphia to co-operate with the big Gothenburg Laboratories in the study of the American Manufacturers' friction problems.*

617



Copyright 1920, by The Goodyear Tire & Rubber Co.

A Mile and a Half a Minute — and the G. T. M.

High speed, normally 7,539 feet per minute, often rising to 9,000 F. P. M., and continuously severe duty in the delivery of from 150 to 250 horsepower, characterize the service conditions on the grinder drive. Every now and then, with a suddenness that imposes a terrific strain on the belting, wet alfalfa packs in the grinder and throws an enormous overload on both belt and engine.

Every grinder drive in the eleven mills of the Denver Alfalfa Milling & Products Co. is equipped today with an 18-inch, 5-ply Goodyear Blue Streak Belt. Each of these powerful, long-lived belts has long since demonstrated by trouble-free, economical service its right to the job, but all of them won this service opportunity on the showing made by a smaller Goodyear Blue Streak and a series of drive analyses by a G. T. M.—Goodyear Technical Man.

It's nearly five years now since a G. T. M. studied the blower drive in one of the Denver Company's plants, and recommended an 8-inch, 5-ply Goodyear Blue Streak Belt for that work. The performance it gave suggested to Floyd Wilson, the Vice-President and General Manager, that a G. T. M. could study with profit to the Company those exacting grinder drives on which new belts were used up every six months.

They went at it scientifically, following the Goodyear Analysis Plan to fit the belt to the duty required. Mr. Wilson furnished the analyst with all the factors of operating conditions that would fill out an expert study of pulley dimensions, horsepower developed, speed, load and overload sustained.

The 18-inch, 5-ply Goodyear Blue Streak Belt which is standard equipment on all the Denver Company's grinder drives today may be studied in its typical operating condition at the McClave plant. It has been transmitting power unfailingly there for two years now—where other belts had averaged six months. It has worked sliplessly—which means, in any transmission, full power delivered—and smoothly, which means, in alfalfa milling, meal uniformly ground.

It has proved its economy in every phase from first cost to this day's grist. Usually, Goodyear Blue Streak Belts involve a slightly higher initial outlay, in favor of lowest ultimate cost. This one, however, cost $103.74 less than its short-lived predecessor. Multiply this by eleven, and add the economies achieved by the trouble-free operation and four times longer life, and the result is the Company's belting profit on Goodyear Blue Streak Belts.

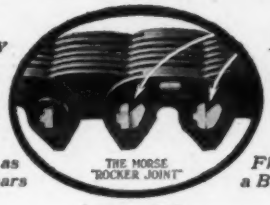
This is the value of meeting a drive condition with a better belt, scientifically specified to the duty required of it. If you have a belting problem, involving either a single drive or an entire plant, the G. T. M. and the Goodyear Analysis Plan are at your command for the utmost in value that we build into these belts that protect our good name. Write to The Goodyear Tire & Rubber Company at Akron, Ohio, or Los Angeles, California.

GOODYEAR

The Drive of Efficiency

MORSE CHAINS

The Drive of Durability



Positive as Gears — *Flexible as a Belt*

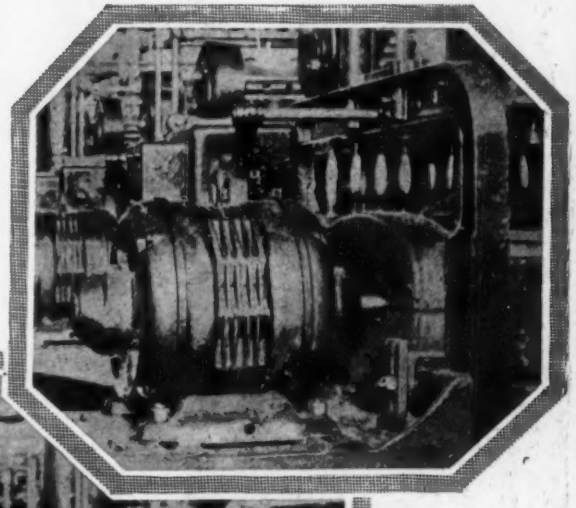
Longer Life

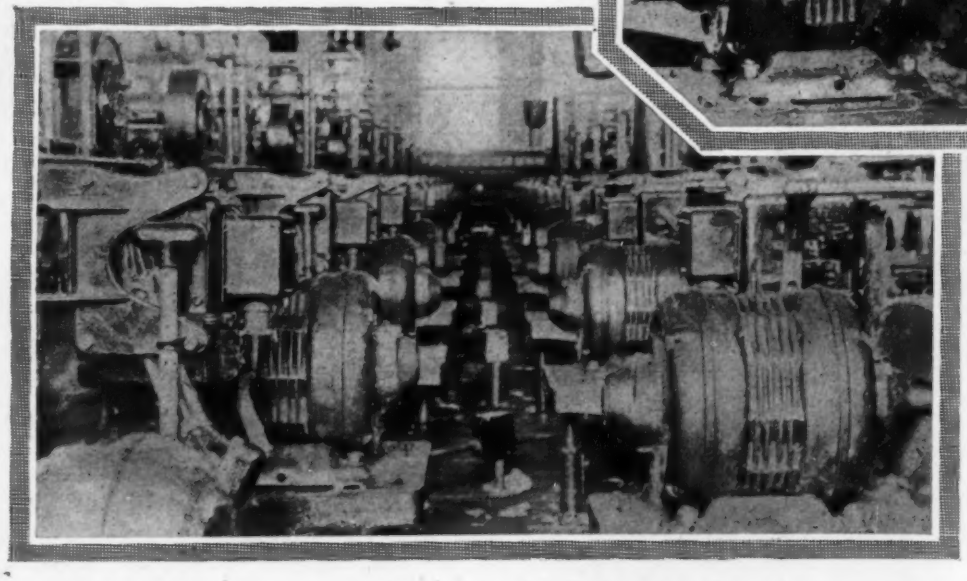
Without Slip, The Production of Silent Chains

FOR Economy in space and Economy in Upkeep.

CLEAN, QUIET.

Runs Cool. Oil Baths Not Required





Lockwood, Greene & Company, Engineers.

Lynchburg Cotton Mill Company, Lynchburg, Va.

"Uniform Speed Increasing Production. Quiet Running Without Jars or Slip Increasing Quality"

Write Today for Technical Textile Booklet

MORSE CHAIN CO., Largest Manufacturer of Silent Chains in the World ITHACA, N. Y.

MORSE ENGINEERING SERVICE

Address Nearest Office

BOSTON, MASS.....141 Milk Street
BALTIMORE, MD.....1402 Lexington Bldg.
CHARLOTTE, N. C.....404 Commercial Bank Building
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PHILADELPHIA, PA.....302 Harrison Bldg.

ASSISTANCE WITHOUT OBLIGATION

PITTSBURGH, PA. .....Westinghouse Building
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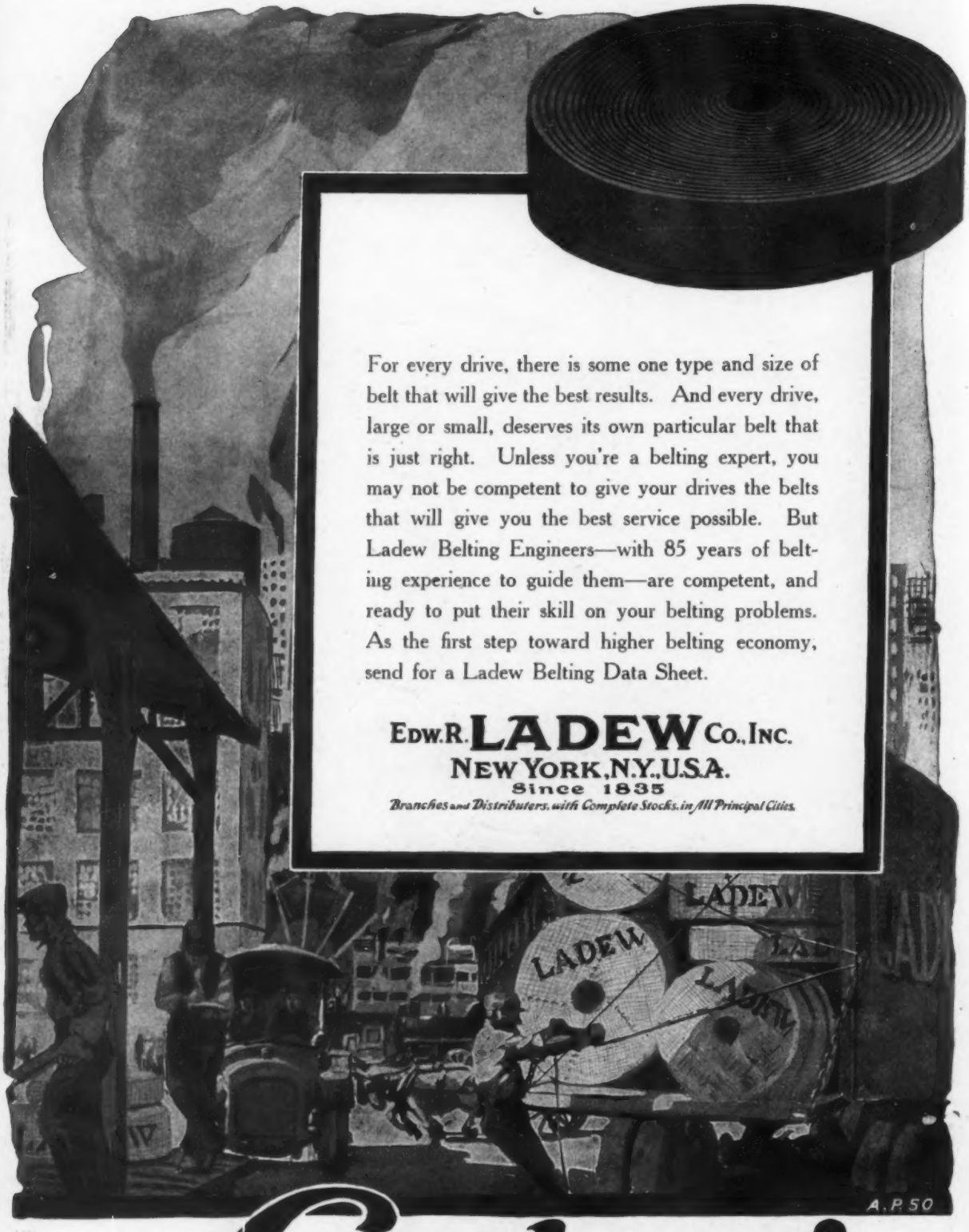
MINNEAPOLIS, MINN...Strong-Scott Mfg. Co., 413 Third St., S.
ST. LOUIS, MO.....Morse Engineering Co., Chemical Bldg.

"Morse is the Guarantee Always Behind the Efficiency, Durability and Service."

In these strenuous times early specifications of requirements are very desirable to insure prompt deliveries.



For every drive, there is some one type and size of belt that will give the best results. And every drive, large or small, deserves its own particular belt that is just right. Unless you're a belting expert, you may not be competent to give your drives the belts that will give you the best service possible. But Ladew Belting Engineers—with 85 years of belting experience to guide them—are competent, and ready to put their skill on your belting problems. As the first step toward higher belting economy, send for a Ladew Belting Data Sheet.

EDW. R. LADEW CO., INC.
NEW YORK, N.Y., U.S.A.
Since 1835
Branches and Distributers, with Complete Stocks, in All Principal Cities

Ladew
SINCE 1835

Dodge Drop Hangers

THE SAFEST ROADBED FOR POWER

with Standard and Self Oiling Bearings

EASY TO ERECT PERFECT ALIGNMENT

From the combined standpoints of strength and reliability, Dodge hangers are the best you can buy regardless of cost.

The adjustable ball and socket support provides a true universal movement of the bearing within the frame but allows no motion of rotation with the shaft.

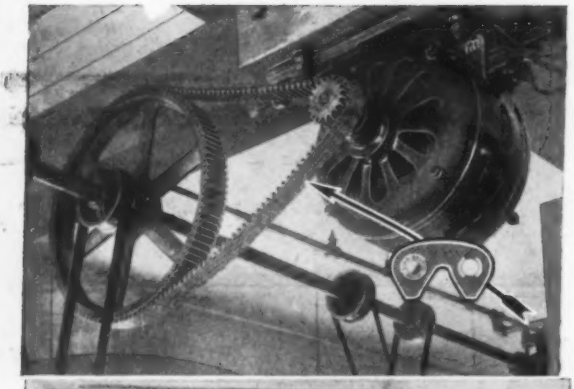
Dodge hangers and bearings are so standardized that any size of hanger will accommodate a wide range of shaft diameters.

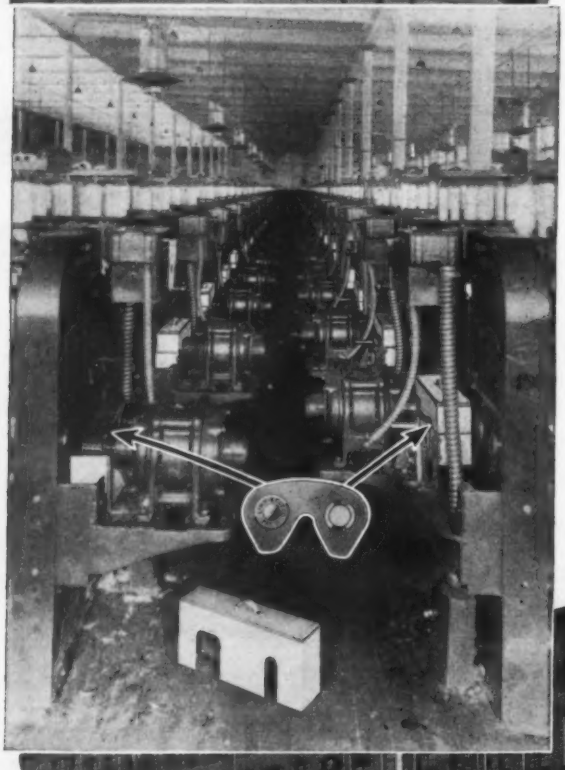
You can buy Dodge hangers in unusual quantities from any dealer; the low friction loss and appreciable saving in oil marks them as the ideal "roadbed for power."

DODGE

Dodge Sales & Engineering Company, distributor of the products of the Dodge Manufacturing Company and the Dodge Steel Pulley Corporation. General Offices: Mishawaka, Ind. Works: Mishawaka, Ind., and Oneida, N. Y. Canadian Plant: Dodge Mfg. Co. of Canada Ltd., Toronto and Montreal

Philadelphia Cincinnati New York Chicago St. Louis Boston Atlanta Pittsburgh Minneapolis Dallas Providence Seattle Newark





202 LINK-BELT Silent Chain Drives

in the Gainesville Mills of the Pacolet Manufacturing Co., Gainesville. Ga. All drives enclosed in casings.

98.2% Efficient Power Transmission

THE installation of a single Link-Belt Silent Chain Drive, as for instance, a line shaft transmission from an electric motor, often leads to the general adoption of the Link-Belt system throughout the plant. We are prepared to furnish sizes from one-half horse power to 500 horse powe rand over, operating at a wide range of speeds.

Write for Textile Catalog No. 425.

537

LINK-BELT COMPANY

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New York - - - 299 Broadway	Seattle - - - - - - 820 First Ave., S.	
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Pittsburgh - - - 1501 Park Bldg.	San Francisco - - - - - 168 2nd St.	
St. Louis - Central Nat'l Bank B.dg.	Los Angeles - - - 163 N. Los Angeles St.	
Buffalo - - - 547 Ellicott Square	Toronto, Can. - Canadian Link-Belt Co., Ltd.	
Wilkes-Barre - 2d Nat'l Bank Bldg.	Denver - Lindroth, Shubert & C., Boston Bldg.	
Huntington, W. Va., Robson-Pritchard Bldg.	Louisville, Ky. - Frederick Wehle, Starks Bldg.	
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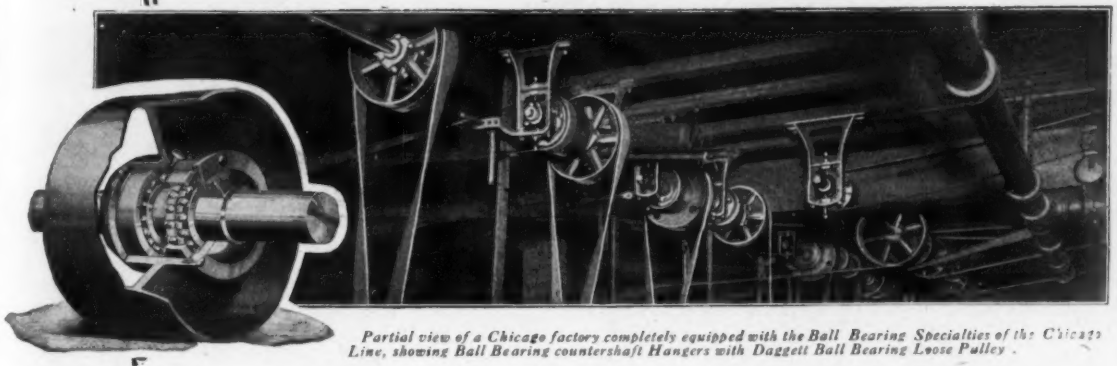
LINK-BELT SILENT CHAIN DRIVES

THE CHICAGO LINE



Partial view of a Chicago factory completely equipped with the Ball Bearing Specialties of the Chicago Line, showing Ball Bearing countershaft Hangers with Daggett Ball Bearing Loose Pulley.

The South is coming into its own. Industry is receiving new vigor and strength. Industrial plants are thriving and new organizations are seeking locations. Old plants are being equipped with modern machinery and equipment.

How about power transmission?

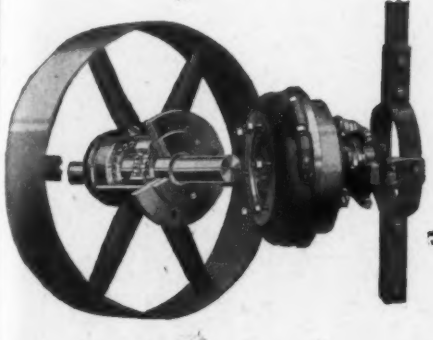
Four thousand shops and factories in Chicago alone have adopted these Ball Bearing hangers and are installing other specialties of The Chicago Line

Daggett Ball Bearing Loose Pulley
Daggett Ball Bearing Clutch Pulley
S K F Ball Bearing Hanger

S K F Ball Bearing Equipped

The Ball Bearing specialties of The Chicago Line are simple in construction, accurately machined, and built of the most durable material obtainable. They are lint proof, dust proof, noiseless, and require a very small amount of lubricant each year.

Investigation, practical demonstration or installation will prove advantageous....



Chicago Pulley & Shafting Co.

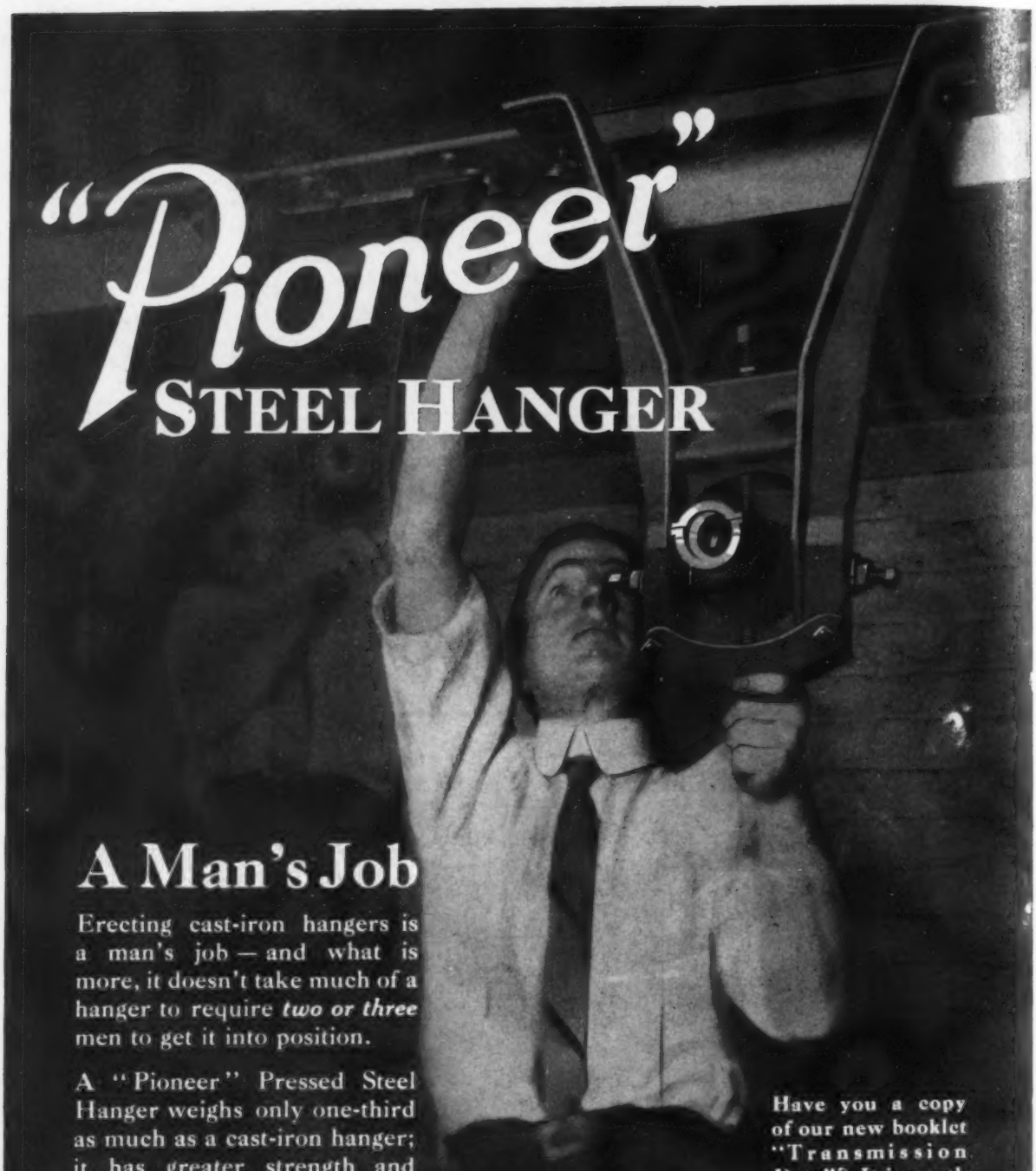
Main Office:
40 S. Clinton St.
Chicago, Ill.

Factory:
Menominee Falls,
Wisconsin

Pioneers in Ball Bearing Power Transmitting Appliances

THE CHICAGO LINE CP&S CO POWER TRANSMISSION

"Pioneer" STEEL HANGER



A Man's Job

Erecting cast-iron hangers is a man's job — and what is more, it doesn't take much of a hanger to require *two or three* men to get it into position.

A "Pioneer" Pressed Steel Hanger weighs only one-third as much as a cast-iron hanger; it has greater strength and costs no more; it can be erected by one man easily.

Why not, therefore, use "Pioneer" Hangers?

Have you a copy of our new booklet "Transmission Data"? It is worth studying. Mailed promptly for the asking.

STANDARD PRESSED STEEL CO.

PHILADELPHIA, U. S. A.

Relieves Your Machine Shop Of Unnecessary Work

In a cotton mill the machine shop should be incidental. The less you have to use it the better your production.

Strom ball bearings replace worn-out shafts and boxes. No textile bearings get harder use than beater and fan bearings on pickers and waste machines.

Strom bearings, with their extra heavy, deep-grooved raceways in which roll big, highly polished, accurately sized balls, are admirably suited for these machines.

Their construction is simple and sturdy, giving maximum strength with minimum friction. They save power, oil and replacements. They pay for themselves in a short time.

In the Southern territory complete bearing equipment for any make of picker can be obtained from our distributor, the Aldrich Machine Works, Greenwood, S. C.

U. S. Ball Bearing Manufacturing Co.

(Conrad Patent Licensee)

4535 Palmer St., Chicago, Ill.

Strom BEARINGS

there is a Texaco Lubricant

for every mechanical appliance

in the mill—

from Opener to Cloth Room

—as well as in the Power Plant.

Consultation with Texaco Lubrication Engineers Regarding any or all of your Lubricating Requirements is ***Invited.***

The Texas Company

Dept. O, 17 Battery Place, New York City

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SPECIALIZATION

The Right Machine for the Job
The Right Lubricant for the Machine
For Textile Machinery That Means

Special Textile Lubricants

NON-FLUID OIL is right for textile machinery because it gives the perfect lubrication of the best fluid oils without the usual dripping and spattering that stains goods in process and wastes the lubricant itself.

NON-FLUID OIL is made of the finest mineral oil with the maximum lubricating ability—but our special process gives it an adhesiveness that it never loses—and that stops the drip and spatter.

Here's a chance to get away from old wasteful methods. Write today for testing samples of NON-FLUID OIL. Our latest bulletins on the LUBRICATION of TEXTILE MACHINERY will be sent free.

Ample stocks always at our branches

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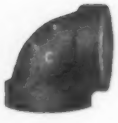

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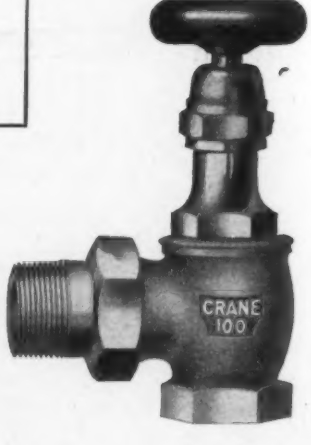
places within your reach, through numerous showrooms and branches, the most advanced ideas on

Heating and Plumbing Equipment

for buildings of all kinds and sizes.

We are manufacturers of 20,000 articles—valves, pipe fittings, steam specialties, etc.—for all phases of power plant equipment, and are distributors of pipe, heating and plumbing materials.



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CRANE LIMITED

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CONSTRUCTION COMPANY
ATLANTA PETERS BUILDING

Organization is one of America's pet words. It means simply a mechanical system of related parts.

The qualities that make an organization effective are ability, loyalty, and team work.

These human, rather than mechanical, characteristics distinguish the men of ABERTHAW.

MEN WITH A PURPOSE

THE things that ABERTHAW builds are not put up for play.

Factories, storehouses, power-plants, shipyards,—each piece of this Company's work constitutes a producing element in the wealth of the Nation.

Each must be designed to meet a need completely foreseen. Each must be constructed so ably, so honestly, so economically, that when the finished plant begins to operate, its output shall be burdened with no unnecessary costs due to a builder's mistakes.

Meeting these requirements is serious business for serious men:—men who are trained for their task, who value reputation above immediate profit, and among whom honesty is not merely a company policy but a personal code.

Today, in an era that offers new problems demanding new means of solution, the steadfast effort of such men is making *Built by ABERTHAW* the accepted symbol of a progressive industrialism that constructs for accomplishment.

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BOSTON BUFFALO
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John W. Ferguson Co.

THE BUILDER'S PART

More than a knowledge of building materials and methods, of brick and concrete, of steel and timber is required of the modern builder.

To him a building must be something more than four walls and a roof with windows and doors and equipment.

The real builder sees every structure as a great machine for the turning out of shirts or automobiles, of steel or candy, every part of which is co-ordinated with every other part.

And he must construct this machine with the minimum of materials and men without the loss of time or money.

The John W. Ferguson Company know industrial building; they know the requirements of manufacturers, whether their product be silk or tin cans, powder or power. For many years Ferguson has been erecting buildings for the leaders of industry—buildings that have fulfilled every requirement—buildings that caused 70% of Ferguson clients to re-order.

JOHN W. FERGUSON COMPANY

65-104

Paterson, N. J. New York, N. Y.

"Atlanta" means Quick Service

ARE you planning to build? Steel sash will be used, presumably, if the building is of fair size, for the better daylighting and ventilation thus given.

And when you are planning the building to make the best use of the sash, it will be worth a lot to have a trained steel-sash engineer at your elbow.

What type? What size? What ventilating arrangement? How shall the timber details, the brickwork or concrete be arranged to take the sash? Are steel girts necessary or can timber be used? Can special sizes and fittings be avoided? What will the whole thing cost, and when can it be delivered?

The Lupton representatives in Atlanta are real service men. They have had a hand in the design of many very modern buildings. They can tell how to use Lupton Products, as well as what to use. They can tell you of many special arrangements by which we have found it possible to get more than ordinary production efficiency, through better-than-ordinary daylighting and ventilation.

The more you make use of them the better we shall be pleased. Write, wire or telephone David Lupton's Sons Company, 1025 Candler Bldg., Atlanta.

Lupton Pivoted Factory Sash—*Cat. 10-LSS*

Lupton Counterbalanced Sash—*Cat. 10-LCB*

Lupton Steel Partitions and Doors—*Cat. 10-LSP*

Lupton Rolled Steel Skylight—*Cat. 10-Misc.*

Pond Continuous Sash, for Pond Truss roofs, monitors, sawtooths, and side walls—*Cat. 10-PCS*

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"Today —— the Sash makes the Factory"

DAVID LUPTON'S SON'S COMPANY

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Makers of Steel Sash Products for Industrial Buildings and Offices

Specialists in daylighting and ventilating equipment for maximum production

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J. E. Sirrine, Greenville, S. C., Architect *Fiske-Carter Construction Co., Greenville, S. C., Contractors*

WindoWalls—In Model Textile Mill

TO meet the demand for intelligent, practical instruction in textile manufacture, the body of progressive mill owners of the south subscribed for the erection of this "model mill" to house the Textile Industrial Institute at Spartanburg, S. C.

—an institution for skilled training in the most advanced practices and mechanical methods of textile production, from the cotton bale to the finished cloth.

In design, structure, machinery and equipment to the last detail, this stands as the ideal textile mill—a composite of the experience and most enlightened thought of owners, workers and engineers.

"We selected Fenestra Steel Sash because we judged it was in keeping with the plans and purposes of our Model Mill. In other words, we think Fenestra the best there is."

Secy-Treas. Textile Industrial Institute

WindoWalls—Their Cost and Their Advantages. This 30-page book gives an interesting and valuable comparison of Fenestra Steel Sash and wood sash costs. Send for a copy today.

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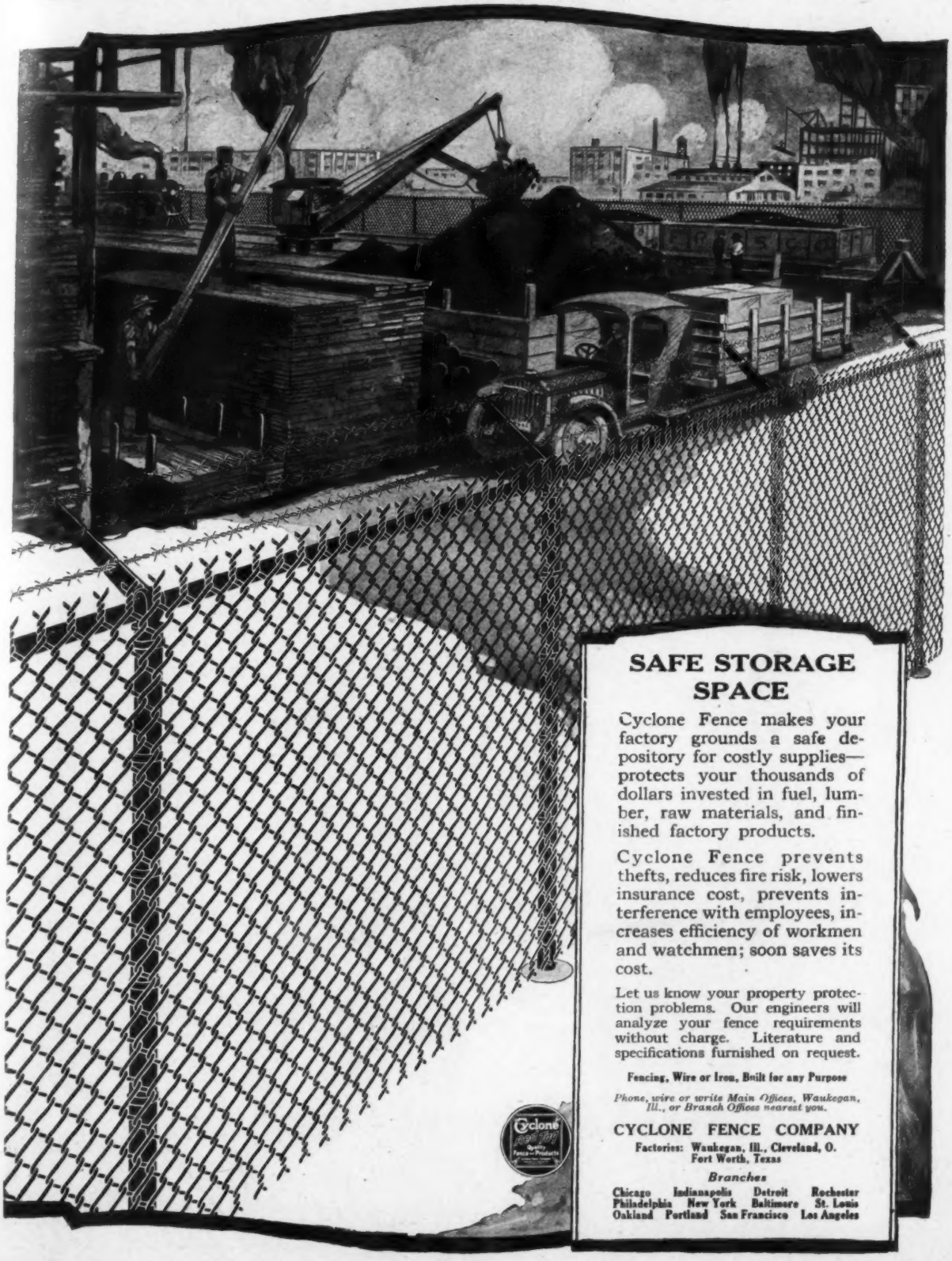
Fenestra
STEEL WINDOWALLS

CYCLONE FENCE



SAFE STORAGE SPACE

Cyclone Fence makes your factory grounds a safe depository for costly supplies—protects your thousands of dollars invested in fuel, lumber, raw materials, and finished factory products.

Cyclone Fence prevents thefts, reduces fire risk, lowers insurance cost, prevents interference with employees, increases efficiency of workmen and watchmen; soon saves its cost.

Let us know your property protection problems. Our engineers will analyze your fence requirements without charge. Literature and specifications furnished on request.

Fencing, Wire or Iron, Built for any Purpose

Phone, wire or write Main Offices, Waukegan, Ill., or Branch Offices nearest you.

CYCLONE FENCE COMPANY

Factories: Waukegan, Ill., Cleveland, O. Fort Worth, Texas

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Pee Gee
MILLITE
LIQUID DAYLIGHT
GOOD PAINTS SINCE 1867

Flood Your Mill with LIGHT

Pee Gee Millite supplies more and better light by reflecting and diffusing sunlight as well as artificial light to every corner of your mill, thereby *increasing the hours of daylight and saving much of the artificial light* required at night. Pee Gee Millite has a high-gloss, a tile-like finish of highest reflective power.

Millite Does Not Turn Yellow

Pee Gee Millite is made by our own perfected process of especially prepared white pigments and long oil, therefore it will not turn *yellow* like ordinary paints which contain lead and varnish.

It is an economical paint, because it is *Washable, Durable, Germ and Moisture Proof.* Saves the expense of frequent repainting, does not peel nor crack and withstands the vibration of heavy machinery.

Pee Gee Millite spreads freely and is easily applied on wood, plaster, stone, brick or metal surfaces, having a covering capacity of 450 to 550 square feet per gallon. It is made in gloss enamel or eggshell finish.

Experimental Laboratories at Your Service

We urge you to take advantage of the expert help we offer you. Suggestions, advice and even the services of an experienced man to supervise the job are yours for the asking—no obligation whatsoever, just a demonstration of the *Pee Gee* idea of thoroughness and efficiency.

There's a Pee-Gee Paint Product for Every Mill Purpose. Write Us.

Peaslee-Gaulbert Company

INCORPORATED

Paint Grinders Est. 1867 Varnish Makers
Louisville - Kentucky

The Favorite Flooring for Modern Textile Mills,
(—and Some of the Good Reasons.)

TUPELO

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FACTORY FLOORS

TUPELO, "The Hard-Wear Lumber," has about every advantage there could be for Textile Mill flooring.

The "Hard-Wear Lumber"

PE-

IN TEXTILE MILLS

"Works Easy —Wears Hard"

It is a "softwood," yet by reason of its "involved" grain it resists severe friction for many profitable years, without the usual tendency to slivering or splintering. Ask your Efficiency Engineer to investigate Tupelo—and then tell you. We invite correspondence with a serious purpose in it.

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0000 HIBERNIA BANK BUILDING, NEW ORLEANS, LOUISIANA, or
0000 HEARD NATIONAL BANK BUILDING, JACKSONVILLE, FLORIDA

WE CARRY IN STOCK THE FOLLOWING STANDARD SIZES OF CORRUGATED BARS

WE RECOMMEND THE EXCLUSIVE USE OF THESE SIZES:

¾" Round	½" Round	½" Square	⅝" Round
⅞" Round	⅞" Round	1" Round	1" Square
	1¼" Square	1¼" Square	

Third Ave. Bridge Minneapolis. Corrugated Bars Used.

The *Shape* of the Ribs on the Corrugated Bar Is Important to All Who Use Concrete.

To be of value as reinforcement, a bar must have an absolute bond with the concrete. If the bond becomes broken, the reinforcement is useless.

The bond of a plain bar depends entirely upon the condition of the surface of the bar. Tests have shown the bond of plain bars to vary from 70 to 700 pounds per square inch, a variation of a thousand per cent.

The Corrugated Bar has a specially formed scientifically designed surface that makes the bond postive and definite. The ribs are at right angles to the axis of the bar and bear squarely against the concrete, thereby preventing sliding.

Full Particulars on Request.

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For engineers, architects, contractors, and students of reinforced concrete construction we offer a handbook "Useful Data on Reinforced Concrete Buildings." Price $2.50.

CORR-PRODUCTS

Corrugated Bars
Corr-Plate Floors
Corr-Mesh
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Corrugated Bars

ELASTIKOTE

HOW WILL IT LOOK THREE YEARS FROM NOW

The real test of paint is not its appearance when it is put on the surface, but how it looks three or four years later.

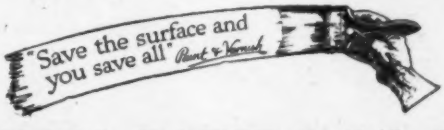
Even a poor and cheaply made paint looks well when first applied, but after a short exposure to the weather it loses its sheen and protective qualities. A close examination will show that the paint film is full of holes, which allow moisture to work through into the undersurface.

ELASTIKOTE

on the other hand, retains its fine appearance for a very long time and presents an unbroken surface to the weather, which absolutely excludes moisture from the surface it is protecting whether it be wood, brick or metal.

The best proof we have of the durability of Elastikote is the large number of customers who order again after a lapse of years. Some of the most prominent manufacturing plants in the country are now using Elastikote—a list will be sent upon request.

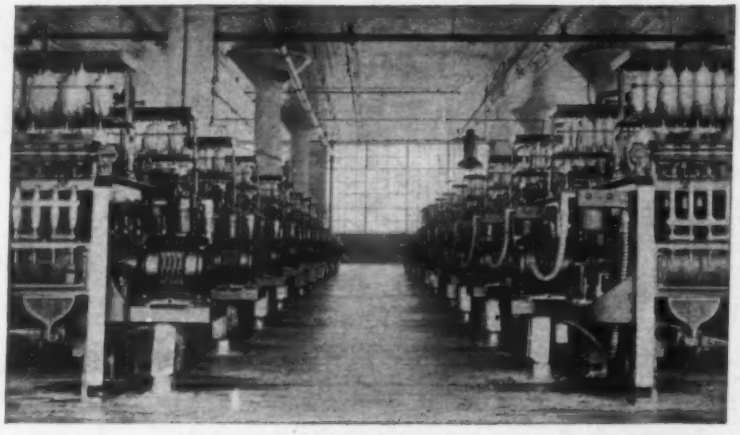
One of our representatives will be glad to call with complete information regarding Elastikote and other Tropical products suitable for your use.



THE TROPICAL PAINT & OIL COMPANY

Cleveland, Ohio

Specialists in the Manufacture of Protective and Decorative Coatings for Industrial Plants.



Thatcher Spinning Co., Chattanooga, Tenn., No. 1 Mill. Individual motor drives on spinning frames, adequate air conditioning and ample light—all factors in uniform and economical production.

Lower Manufacturing Costs Can be Made to Offset Slackened Demand

Every textile operator is facing stiffer sales competition. The profits which were liberal, now show narrow margins—margins that are governed by demand, raw materials and manufacturing costs.

The demand is not so great as it was, but there will always be a demand. So it is simply a question of what proportion of this total quantity each operator can sell—provided he can still sell at a profit.

This will depend upon his manufacturing costs. The lower these are the better his position in the face of competition.

Manufacturing costs divide themselves into those of overhead, labor and the condition, efficiency and arrangement of the mechanical equipment. The first two items are relatively fixed, they will not vary greatly, so it is evident that the problem will center on the machinery for production.

If these facilities are antiquated, the operator is in a bad position. His manufacturing costs are sure to be high. But even if they are modern, their efficiency may be greatly impaired by poor grouping, power wasting drives, or many other handicaps, some of which may not be recognized.

It is here that the competent engineer, trained and experienced in textile problems, can frequently save the operator many times his fee, in the reduction of manufacturing costs affected by his recommendations.

Write for "Picks to the Minute," a booklet on the Engineer's part in solving problems of the textile industry.

J. E. Sirrine & Company

Greenville, South Carolina — **331 Madison Ave., New York City**

See also our advertisements in Literary Digest, Commerce and Finance, and Manufacturers Record. Other interesting booklets sent on request:—"Rivers in Harness," "Factories for the Future" and "Contentment Under Roof."

SERVICE

CONDULETS

Mogul Condulets—Big Wiring Chamber
A New Series

Type BU with 1-wire cover.

Type BUB with 7-wire cover.

MOGUL Condulets are designed to meet the demand for a Condulet having an unusually long cover opening so as to avoid kinking heavy wires or cables when pulling in or feeding through a conduit system. Furthermore these Condulets have a large wiring chamber for making splices or taps.

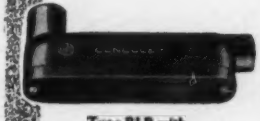
Mogul Condulets though liberal in their proportions do not materially affect the general outline of the conduit system. The hubs have integral bushings and tapered threads. Fastening screw holes are located at the ends of the cover opening.

Mogul Condulets are made in eight types, each type in eight conduit sizes ranging from one to four inches.

There are four sizes of composition and cast iron covers, each size being common to two sizes of Mogul Condulet bodies. The composition covers are made with from one to nine wire holes; also blank, which can be drilled by the user as required.

The cast iron covers are made in two types, with gasket or without gasket. The gasket is made of round rubber, cemented into a groove in the cover. The cover fastening screws are furnished with and secured to the cover.

Type BX with 2-wire cover.



Type BLB with blank cover.

CROUSE-HINDS COMPANY

SYRACUSE, N. Y.

BOSTON NEW YORK CHICAGO

Condulets Panelboards
Knife Switches Floodlights
Guy Anchors

1579

Type BC with 4-wire cover.

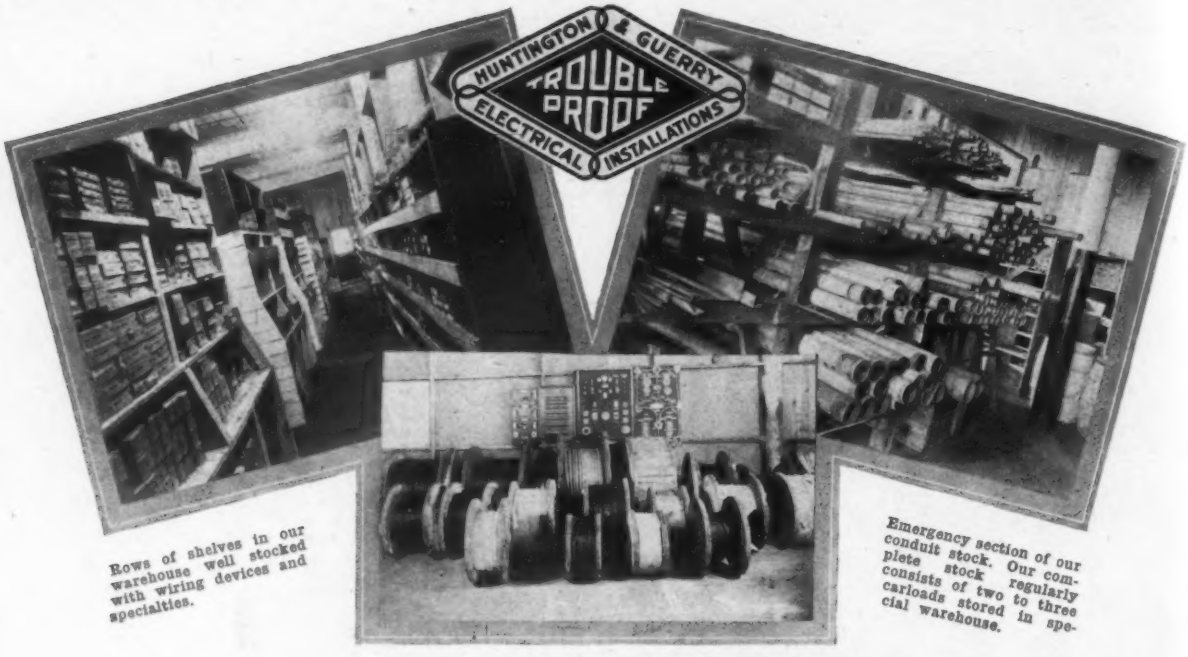
Type BBE with 9-wire cover.

Type BT with 3-wire cover.

Condulet the Job

Type BTB with 5-wire cover.

CROUSE-HINDS



Rows of shelves in our warehouse well stocked with wiring devices and specialties.

Emergency section of our conduit stock. Our complete stock regularly consists of two to three carloads stored in special warehouse.

Portion of our stock of wires and cables to show variety of size and types carried. Our complete stock regularly consists of 12 to 15 tons.

AT YOUR SERVICE

A regular stock of materials large enough to wire one or two cotton mills of average size.

Two to Three Carloads of Conduit

Twelve to Fifteen Tons of Wire and Cable

All Kinds of Wiring Devices and Accessories to Match

We maintain this stock exclusively to give our customers prompt service on wiring installations—not for general sale.

You know what this means in these days of slow deliveries and curtailed production.

YOURS FOR SERVICE

HUNTINGTON & GUERRY, Inc.

GREENVILLE - SOUTH CAROLINA

Ideal Lighting

Cutter Industrial Reflectors

With Westinghouse Mazda Lamps

"Easy to Wire" Guaranteed Weather-Proof
Cover for 4" Outlet Box or Condulet
Cap for ½" or ¾" Conduit
Holder Socket with Lamp Grip
Gasket
One-Piece Sol-lux Reflector
RLM STANDARD DOME TYPE

The latest and best in illuminating engineering practice is embodied in the design and construction of Cutter Industrial Reflectors.

Interchangeability and the "Easy to Wire" features are, perhaps, the most important.

Interchangeability assures a suitable combination for every condition of service.

The "Easy to Wire" feature saves time and labor cost.

Cutter rugged fixtures are most suitable for lighting textile mills, also for outside use where their weather-proof construction assures reliable operation.

Made in four standard types, all interchangeable:

RLM Standard Dome or Distributing Type Reflectors designed for general lighting where average spacing and ceiling heights prevail.

Standard Bowl Type Reflectors for high mounting heights and intensive local lighting.

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Bulletin No. 3337 tells all about them

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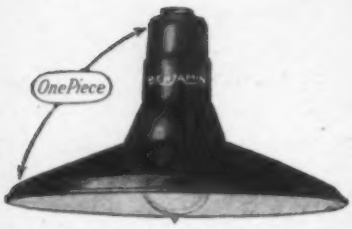
Westinghouse Electric & Manufacturing Company
George Cutter Works, South Bend, Indiana

Benjamin Reflectors Meet Every Industrial Illumination Requirement



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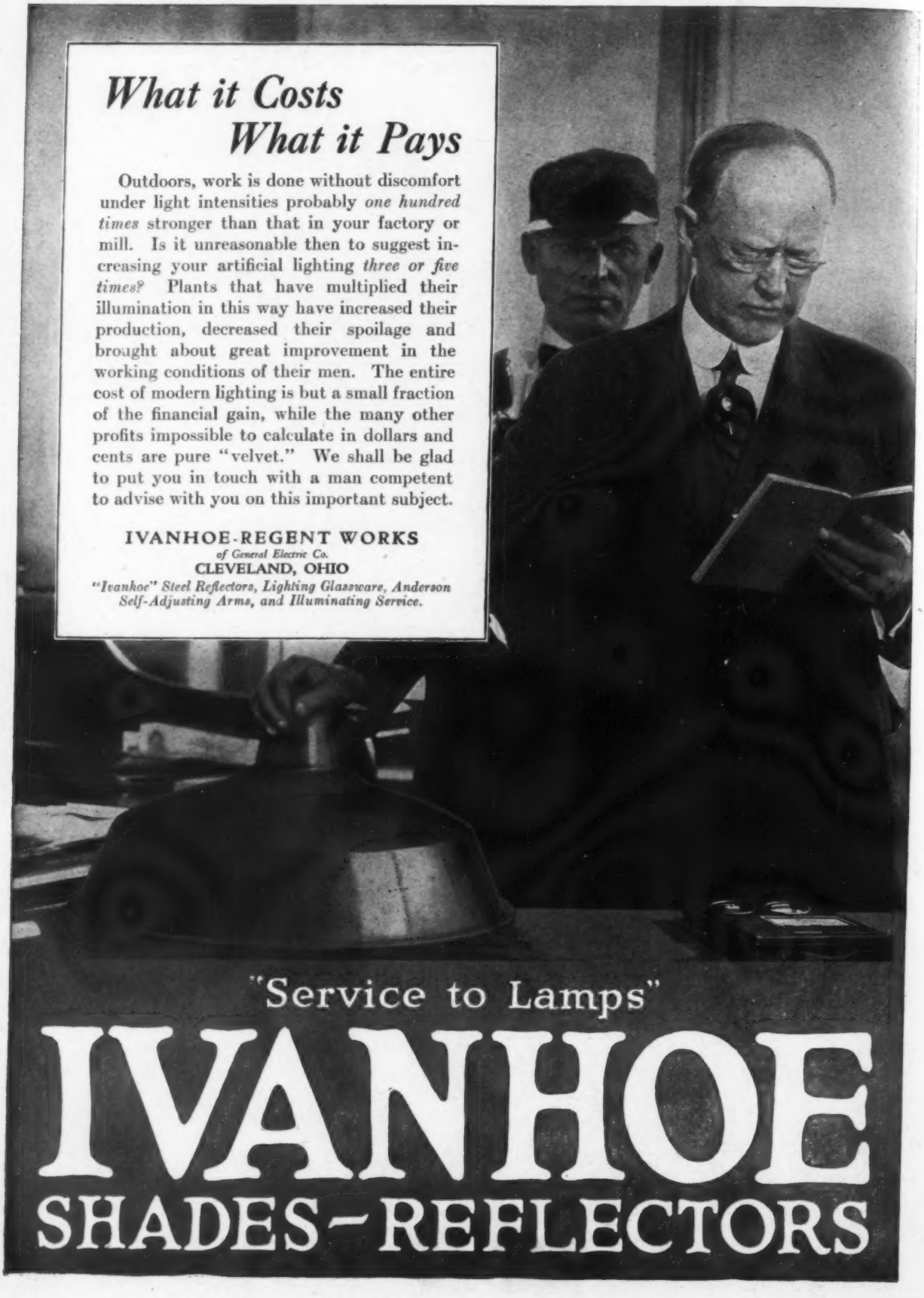

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"Ivanhoe" Steel Reflectors, Lighting Glassware, Anderson Self-Adjusting Arms, and Illuminating Service.

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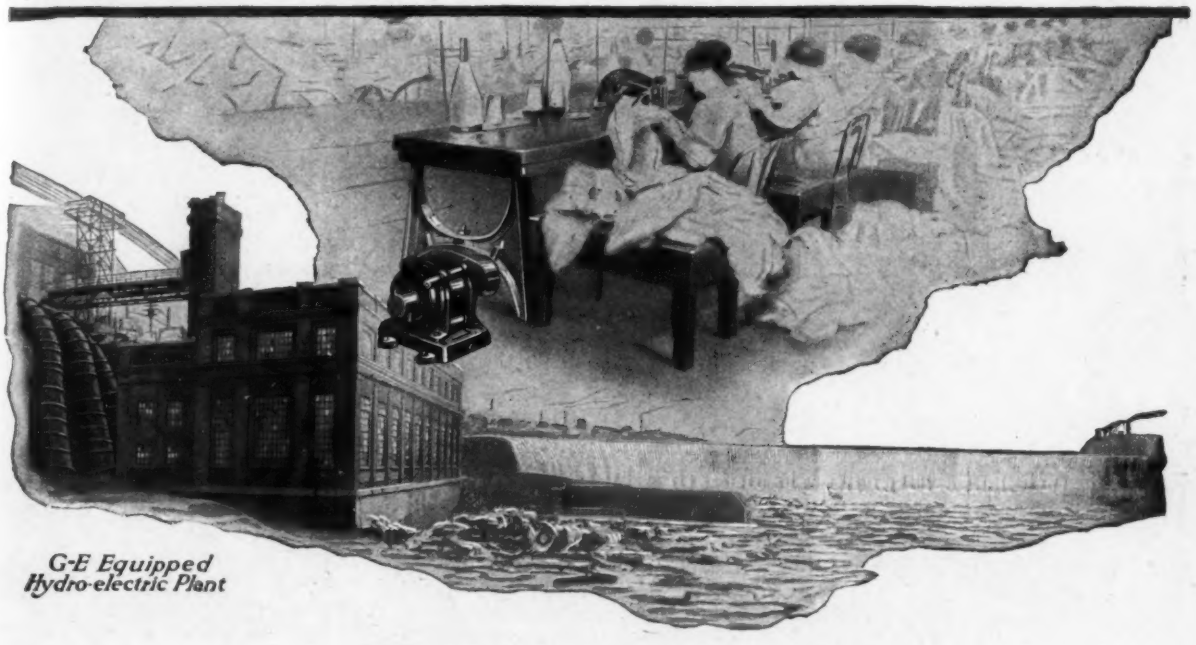
SHADES-REFLECTORS

In many cities production can be increased, its quality improved, and new industries added by efficiently making and using the available power



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How electricity increased and improved a textile city's production

EACH mill in a certain textile city was driven by its old water-wheel—production was low, so was quality.

In summer, low water and leaky canal beds slowed up the wheels—in winter, anchor ice did the same.

Finally, G-E textile mill specialists were called in to suggest a better way of using the water power.

A central water power plant was built to supply all mills with electric power and provide a surplus for new industries.

Electric drives at each mill applied power directly to productive machines, and losses due to mechanical drives were largely eliminated.

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Its output was increased 35% and a very much better product resulted.

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G-E motors

From the Mightiest to the Tiniest

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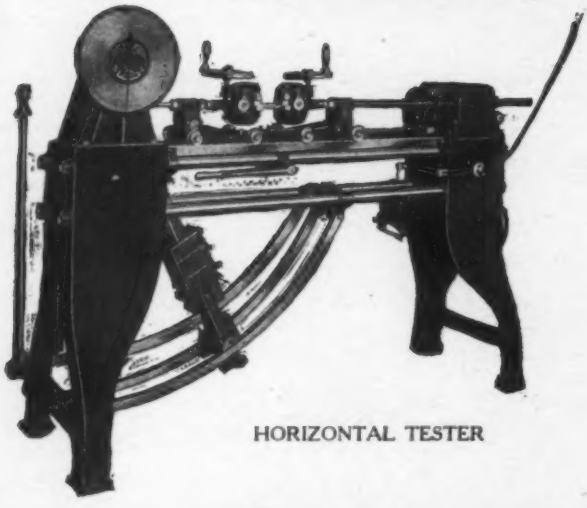
SCOTT TESTERS



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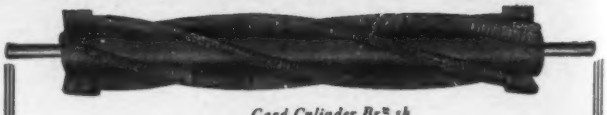

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Joseph Dixon Crucible Co.
JERSEY CITY, NEW JERSEY

Established 1827

WHO'S WHO IN TRADE-MARKED SILKS

THE great length of the trade-mark list in the silk industry will be a surprise to a great many. The general opinion has been that perhaps there was no branch of the textile industry in which trade-mark names were so little used as in silks. According to the big list compiled by the Silk Association of America it would appear that the silk people lead the other lines in the number of trade-marked materials placed upon the market.

—From a recent editorial

—the list of textile mills that trade-mark their goods with Kaumagraph Dry Transfers, reads like the list of the leaders in the industry.
If your place is among these leaders, we will be glad to demonstrate what has convinced the others that the Kaumagraph Dry Transfer method of trade-marking is first on legibility, first on speed, first on economy.

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have the right "feel" and appearance.

An important feature of our loom harnesses is their appearance and their "feel." Their smooth finish and their freedom from defects show that they will weave well, and their soft pliable "feel" shows that they are tough and elastic and will therefore wear well.

G
TRADE MARK

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SACO, MAINE

With the Publishers—

STEPHEN R. GORDON

Some Bonus Systems—and Others

During the recent war period many mills paid bonuses to operatives. These bonus payments were made to cover a number of different points in the industrial relations between the management and the employes, but fundamentally they were intended to increase production. Unfortunately for the present peace of mind of many mill managers no definite or well developed system of bonus payments was evolved; in the majority of cases no expert was consulted and seldom was the experience or practices of other plants investigated—hence their present difficulties.

A story is told of a young engineer who had charge of laying the foundations for the steel structure of a large railroad terminal. While the work was in progress this engineer was not particularly impressed with the importance of the job, taking it merely as a matter of course. Since the completion of this terminal the engineer in question often has occasion to pass through this station and he often wonders what would have happened had some of the foundations which he laid been out of line or out of level and the finished structure twisted first in one direction and then in another. This same tendency to minimize their work and to neglect to visualize the finished product of their joint labor is often found in many executives, department heads and lesser employees in manufacturing lines.

This tendency is undoubtedly the *raison d' etre* for the industrial engineer whose duty it is to secure the best possible results out of every activity and so correlate the efforts of all that the highest quality and greatest quantity of product may be secured at the lowest cost and with the least waste.

In order to illustrate the beneficient results to be obtained through the adoption of a suitably designed piecework and bonus system in a textile plant the Editors are publishing in another section of this number of COTTON an actual example from an underwear mill. Its title is "Increasing Production—Reducing Cost."

Stephen R. Gordon, the author of the article, is a well known industrial and production engineer. He graduated from Princeton University in Civil Engineering in 1909. For several years he followed the civil engineering profession with the New York Central Railroad and the Board of Water Supply of the City of New York. Later, becoming interested in industrial engineering and realizing the importance of specializing, he accepted a position with Miller, Franklin, Bassett & Co., industrial engineers.

During the past seven years Mr. Gordon has prescribed for industrial ailments in more than 100 factories, installing cost, production and general efficiency methods. During six months of that time he was employed by the Otis Elevator Company as production manager in their Yonkers plant. For the last three years he has specialized in the textile industry and has installed cost and production systems in a number of mills, among which are such representative concerns as the Chalmers Knitting Co., the Utica Knitting Co., Frisbie and Stansfield Co., the Sullway Hosiery Mills, Max Lowenthal & Sons, etc. Just recently he formed an industrial engineering organization to better carry on this work, known as Gordon and Staff with temporary offices at 450 Fourth Avenue, New York City.

Why Does a Manufacturer Advertise When He Is Behind With Deliveries?

This seems to be a very natural question, and the answer involves the discussion of a vital policy of business—a policy that is fundamental.

The Joseph Dixon Crucible Company answer it by saying if they were building a business for today their policy would vary from day to day with the temporary changes with which every business has to contend. But they are building for the years to come, and they hope that the business will become many times greater than it is today. Without the proper foundation it would undergo violent changes dependent upon temporary national, local or even imaginary conditions.

They continue, "If we should permit ourselves to become inflated with self-confidence when business conditions are favorable, restricting our selling and advertising activities, and then go down in the dumps when conditions are not so favorable, this business would not amount to any more than the existing conditions would make of it.

"If our efforts should be halted in the middle of the road in times of liberal buying to wait on the manufacturing department, there might come a time when the manufacturing department would have to suspend operations while waiting on the sales organization.

"With such a policy we would be running around in a circle, disorganizing one day and reorganizing the next.

"In this business advertising is a sales policy—the same as our policy of maintaining a sales organization—and we might as well consider the elimination of one as the other. Neither will be eliminated, as this business needs both if we are building for the future."

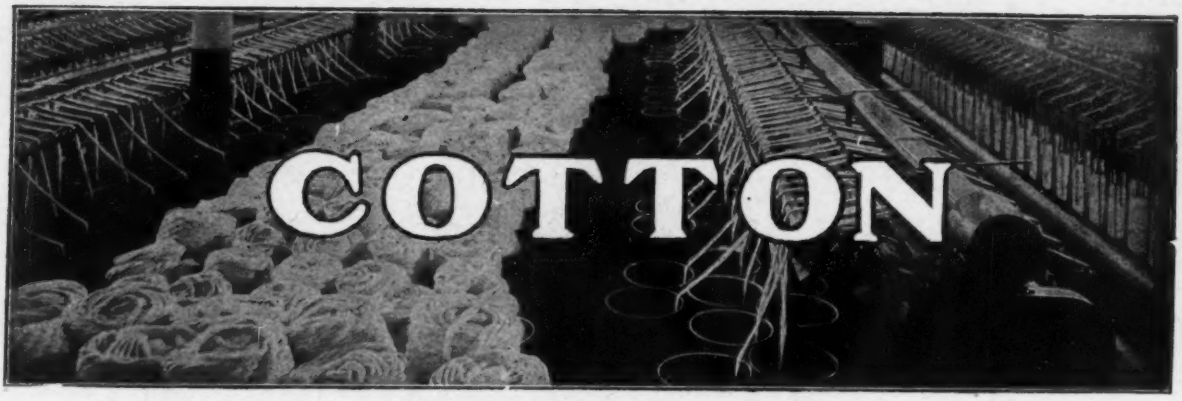
AMONG COTTON'S READERS

Thomas H. Rennie

Manager Avondale Mills, Pell City, (Alabama) Division
Past President American Cotton Manufacturers' Association

"I have just had two hours of enjoyment with the June number of COTTON and I cannot resist the urge of writing and congratulating you. . . . I like COTTON because it keeps me informed as to efforts and ideas of the best men in the practical end of the business as well as giving newsy articles on the business as a whole.

T. H. Rennie



September, Nineteen-Twenty

The World Demand for Cotton.

One of the interesting subjects that will be much discussed at the World Cotton Conference next June will be the future sources of supply to which manufacturers will have to look for their raw cotton. The present scarcity of labor, the tendency toward diversification of crops, an increase in insect pests, and the growing agitation among the planters for a limited production, can only mean one thing for the South—a continuance of short crops and high prices. This latter is what the southern planter hopes for as an ultimate result, but, unfortunately, he fails to realize that the inability to secure raw cotton at its greatest source of supply can only induce its cultivation in a number of other places which will inevitably react on him through a lessening in demand and a consequent reduction in the price he is striving so hard to uphold.

World cotton statistics and conditions clearly indicate a shortage of cotton. Even should the present crop reach thirteen million bales, which most men in touch with the belt think unlikely, the demand will still be much greater than the supply. Since 1914 there has been little increase in cotton production, whereas the consumption by the mills not only shows a large increase, but new mills, new machinery and new uses for cotton products are constantly being developed.

It is true that successful efforts are being made to utilize some of the so-called low grades in which the American crop has been so prolific during the past few years. An example of this is the present development in Texas "snap" cotton. This is the cotton remaining in the fields until long after maturity because of the scarcity of labor and when picked the stem snaps allowing the remainder of the boll to adhere to the lock of cotton. It is reported that there are around 700,000 bales of this cotton available and the price has ranged around 18 cents a pound. Experiments at cleaning this "snap" cotton have proven so successful that cloth containing 100 per cent of cleaned cotton is fully as good in appearance as the same grade of cloth made from Georgia upland strict middling with the usual mill cleaning, and the breaking strength is better than the Georgia upland cotton.

Undoubtedly a continued shortage of the better grades is going to force the mill man to continue to use his ingenuity in the working up of the lower grade material, frequently with considerable advantage to himself until his methods become known and the demand for his particular type forces up the price. The accumulation of a considerable amount of any particular type of low grade at a concentration point or market at the present time always causes a very decidedly favorable "difference" in the price of that type, from the standpoint of the purchaser, in its relation to middling.

The present world consumption of cotton is around 21 million bales and it is predicted by a writer on this subject that this amount will be doubled in 20 years if cotton can be secured to fulfill the demand. There still remains an immense acreage in the South that could be devoted to cotton, at least in part, if the labor and the incentive were present. Current prices would seem to provide the incentive and it is not at all an uncommon sight to see tractors using headlights and working at night at certain seasons of the year. It's the hand pickers that are scarce.

That the boll weevil is in a measure responsible for this labor shortage is a fact unknown to some. An example of this may be seen in Elmore county, Alabama, which made around 32,000 bales of cotton in 1914. Because of the low price that year the planters curtailed the acreage and in 1915 the crop was about 20,000 bales. In 1916 the boll weevil hit the county and reduced its cotton production to 8,452 bales. In 1917 the production was slightly less. Since 1917 this county has never made over 17,000 bales in one year. Because of the two extremely low years the negro labor left the section in large numbers, and, as this was during the war work period, many went to the northern manufacturing sections, particularly the middle west. These have, for the most part, never returned.

Setting aside the South for a moment and looking to other sections of the world, it would seem as if Egypt had about reached its limit as a cotton producer. Northern Africa is unlikely to ever prove a large or reliable development, although it is growing. India has possibilities for a greatly increased production and is forging steadily ahead. China also has great future opportunities if her people would adopt more modern methods of crop making and improve transportation facilities. However, as has recently been shown in COTTON'S pages, the leaven of

progress is working and it is difficult to foretell the future. Peru, Mexico, California and Arizona might be termed specialists along certain lines of cotton growing for certain special industries. While their production is increasing, it is doubtful if they will ever be able to produce in sufficient quantities to satisfy the needs of those industries.

Having canvassed the present producers and finding opportunities for reasonable growth only in India, China and the South, and these probably insufficient to meet the prospects ahead, let us examine some irrigation projects that the British seem to have in mind. The greatest of these is lower Mesapotamia, at one time, when irrigation canals from the Tigris and Euphrates rivers watered the section, one of the garden spots of the earth. It is stated that British engineers have long had plans for reclaiming this territory for the express purpose of turning it into an enormous cotton producer and the continued shortage, present and prospective, with the constantly increasing prices, make such a plan more and more promising as the years go by.

Another British project is in Australia. This particular section is said to have the climate but also needs irrigation. However, even if this difficulty was overcome, the necessary labor and the long water haul to the mills would seem to militate against it.

Returning to the South, it would seem as if more scientific and more intensive cultivation of the present acreage, and the opening up of other southern land that is readily available, is the answer to the immediate needs of the present. If the growers' associations would devote more of their energy to encouraging these special features, it would not only greatly aid in providing for the needs of the world, but would also redound in a greater and still more prosperous South.

An Incident With a Moral.

The following recent occurrence at the Kilburn Mill, New Bedford, Mass., is worth reciting as it carries its lesson with it:

When the card room overseer came to work on the morning of June 18th, he smelled smoke in the mixing room in No. 2 Picker House and located fire in a pile of opened cotton. This was wet down by the contents of fire pails and removed from the building. Upon investigation it was found that oily card room waste had become mixed in with the cotton and had ignited spontaneously. About two hundred pounds of cotton were burned. Loss, $217.-94.

At 2:30 p. m., on June 28th, the picker room foreman of the same mill smelled smoke and examined the shaft bearings for overheating but found none. After considerable searching he located the trouble in a bin of opened cotton which had been filled the previous week. No smoke was visible and men were set at work removing the top of the pile and carrying it away. When within a few feet of the floor and in the center of the pile a section of cotton was found smouldering. This was covered with burlap bagging soaked with water and removed from the building in metal barrels. Neither the cotton beneath nor the floor were scorched and as a result of the good judgment shown in handling the fire the loss was confined to about 800 pounds of charred and smoked cotton. The cotton in which the fire originated had been in the bin two months and was mixed with card room waste. It was opened in a bale breaker which delivered on to a lattice conveyor from which it was dropped into the bin. As the location and circumstances of this fire and the similar one of June 18th in No. 2 Mill indicated spontaneous ignition, the card room waste was examined and a number of pieces were found which were oily. Undoubtedly some of this became mixed with the cotton in the bin, causing the stock to ignite spontaneously. Loss, $852.02.

The Mississippi Valley Association.

This is a volunteer general association organized for the purpose of massing the strength and influence of twenty-seven states in the solution of those problems which now stand in the way of the attainment of economic freedom. The association maintains an executive secretary and a small employed force in its general office at St. Louis. All other officers are volunteers without compensation.

Briefly mentioned, the specific objectives of the organization are as follows: the development of waterways by the federal government, including the Mississippi River from Minneapolis to the Gulf, the Missouri and Ohio Rivers, the Illinois River, several important tributaries, the Black Warrior River, and the Intercoastal Canal from Florida to Brownsville, Texas; the building of efficient terminals and water-side warehouse facilities; the elimination of freight rate differentials and the building of a rate structure which will permit the use of inland water craft in full coordination with the railroads, with the intention of reducing the cost of transportation to handlers of commerce; the adoption by the federal government of a constructive program which will result in the efficient development and use of the water, soil, mineral and forest resources of the country, so that water now going to waste in destructive floods may be soaked into the ground through contour plowing, diverted to dry lands in the form of irrigation or impounded to augment stream flow in dry seasons, thereby preventing soil erosion; also that more efficient methods of mining may be employed and denuded areas be reforested.

One of the features of the proposed work of this association of especial interest to manufacturers will be its efforts to induce legislation at the hands of Congress and state legislatures, which will foster and encourage labor-employing and commerce-developing enterprise, instead of discouraging such enterprise as is now too frequently the case. To this end the government is being asked to create a policy toward business and the machinery incident thereto, wholly removed from partisan political influences.

This is a large order. If the association membership succeeds in separating politics and business and the developing of sane legislation from a state and national standpoint it will have accomplished a worthy achievement. Its efforts toward national development are all good, but this is one case where the last should be first. Such a transposition, if successfully accomplished, will go a long way toward bringing success in the other objectives for which the association is striving. Its efforts will be watched with interest.

Increasing Production—Reducing Cost

An Actual Example from an Underwear Mill

BY STEPHEN R. GORDON.

OF GORDON AND STAFF.

An 18 per cent increase in production without an additional operator, accomplished through a fifty fifty scheme. Pay the operatives fifty per cent of material, waste and overhead expense that they can save. Also give a fifty per cent increase in pay for all production over a fair standard and pay an additional bonus for maintaining the standard production over a period of time. These are the things the employees know and will take an interest in. Sounds radical doesn't it? Read about it.

Application of the foregoing principles will arouse the interest of the factory worker and tend toward an endeavor on his part to increase production and overcome the present-day spirit of unrest and dislike for honest work. This problem has confronted the managers of industry to a more or less extent for several years and has spread to such proportions that today it is a veritable disease. Exponents of scientific management have prescribed many cures, some of which have been successful and others dismal failures.

We have all heard of and read about "Industrial Democracy," which is an attempt to counteract the labor unrest by giving the employees a voice in the management of the business and turn over to them a share in the profits. This is a worthy endeavor and is an ideal arrangement, but the ideal is not always successful. In some cases, "Industrial Democracy" has worked, but the ultimate success of the scheme depends primarily upon the personnel of the management, who must perpetuate the system after it has been installed.

The success of the system during the installation period depends entirely upon the personality of the expert employed and his ability to sell the idea to the employees. When the scheme has been developed and running smoothly, presumably by reason of a spirit of enthusiasm and cooperation, the services of the high priced expert are dispensed with. The organization must then stand on its own merit, without outside assistance.

In the majority of cases the first enthusiasm gradually dies down with a resulting slowing up of the activities of the committees and the scheme gradually falls into disrepute. The fault lies in the fact that the scheme has really been fostered and developed around the belief and enthusiasm of an individual who, through personal contact, has been able to impart a temporary belief and enthusiasm in the minds of the employees, who took the scheme on faith and really did not understand it, nor were they sometimes sufficiently educated to realize the mutual advantages to employee and employer. The system is almost invariably wished on the employees and not developed through any request or desire on their part.

If labor could be taught the general principles of economics and business management and educated constructively to the extent that they are now being taught destructively by labor organizers and agitators, and a desire for such a scheme be created in the minds of the employees so that they would request its development, "Industrial Democracy" would be, in my opinion, a panacea for labor unrest, but until that day comes, and we hope that it may, the law of supply and demand will regulate the labor market as it does the markets of all other commodities.

Human nature is the same the world over. We all crave power and authority, but how many of us are willing to assume the responsibilities which accompany the assumption of authority. The proletariat is envious of a more exalted position, and in its ignorance, upbraids and slanders the so-called capitalist. They forget that the majority of capitalists were at one time also of the proletariat, and advanced through individual endeavor and ability. We cannot all be leaders, for very few of us have the ability to coordinate the efforts of others, but through experience and education any person can better his position. The proletariat should be taught this point of view which would make them less prone to rail at a fate that presumably grinds them down.

The proprietor of the corner grocery store or the humble cobbler who repairs our boots are both capitalists, for they operate on borrowed money and employ labor. In fact, any of us who are willing to accept the responsibility and risk our savings in the employment and coordination of the efforts of others may become capitalists. A small percentage of individuals take advantage of this opportunity, but the majority will rail at the individual who has actually created the opportunity for them to make a living. A man who has attempted to run a business of his own and failed is ordinarily the best satisfied employee. He has learned that being the boss is not so flowery a bed as it might appear.

Since the proletariat has not been educated along the right lines and are unwilling to accept responsibility, they cannot properly collaborate in the management of a business nor should they share in the profits. A few concrete examples will probably best illustrate the fallacy of factory employees sharing in profits.

A factory during a period of flourishing business makes a good profit and pays the employees accordingly, their share amounting to a considerable figure. During the next period, due to a business depression, the profit is practically nothing. The employees therefore do not get a bonus and explanations will not shatter their belief that they have been unfairly treated. Take another phase of the situation. A very large manufacturer decided upon a profit-sharing scheme. At the end of the first six months he announced that half of the profits of the business, amounting to $500,000, would be distributed among the employees. Average workmen have no conception of figures and $500,000 meant

Jane Smith

PAY ROLL

Dept. Finishing
Operation Flat lock
Piece or Day Work P.W.

Married or Single Single
Nationality American

Address 11 State St.
Phone No. 1009 Central
Male or Female Female.

Week Ending	Hours Worked	Rate	Gross Amount Earned	Ded.	Net Amount Paid	PROD. LABOR Piece Work	PROD. LABOR Day Work	Non-Prod. Labor	Learners Expense		PRODUCTION BONUS % Pay Day Work	PRODUCTION BONUS Hrs. Excused Absence or Lost Time	PRODUCTION BONUS Total Units Produced	PRODUCTION BONUS Production Bonus	PRODUCTION BONUS Production Maintenance Bonus	ECONOMY BONUS % of Pay	ECONOMY BONUS Amount	Total Bonus	
Jan. 3rd	48		17 49		17 49	17 49													
" 10	48		14 83	2 00	12 83	14 83													
" 17	50		23 00		23 00	20 00	3 00												
" 24	50		22 30		22 30	21 00			1 30										
" 31	48		23 85		23 85	21 85		2 00						Bonus started Feb. 1st					
Jan. Total			101 47	2 00	99 47	95 17	3 00	2 00	1 30										
Feb. 7th	46		25 44	1 00	24 44	24 44						2	2448	1 22	1 00				
" 14	48		27 10		27 10	27 10							2710	2 05	1 00				
" 21	50		28 61		28 61	27 61		1 00					2761	2 30	1 00				
" 28	50		27 94		27 94	27 94							2794	2 47	1 00				
"																			
Feb. Total			109 09	1 00	108 09	107 09		1 00						8 04	5 00	32½	3 43	$16 82	
March 6th	48		etc.																
"																			
"																			
"																			
Mar. Total																			
April																			
"																			
"																			
"																			
"																			
Apr. Total																			
May																			
"																			
"																			
"																			
"																			
May Total																			
June																			
"																			
"																			
"																			
"																			
June Total																			
July																			
"																			

This is a duplicate of an actual Pay Roll Sheet.
Note the increase in Piece Work earning after Bonus started.
Increase in Piece Work earning represents a corresponding increase in production

FORM 3.

all the money in the world to them. They immediately told the management that if the company could make such enormous profits, they could pay higher wages, and demanded a 50 per cent increase. As a matter of fact, the $500,000 represented a profit of less than 15 per cent of the invested capital, but that meant nothing to the employees as they probably didn't even know the meaning of invested capital. The final result was a three months' strike.

A business can only develop through cooperation, and about the closest approximation of cooperation in labor is the organizing of unions to force an increase in wage. Even in this they have fought as much among themselves as they have against industry.

High wages are not objectionable, provided the productive effort increases correspondingly, but the present attitude is "get as much as you can and work as little as possible." I have kept records in many of the textile mills during the past year, and in the majority of cases for every general increase in wage there has been a corresponding decrease in the productive effort. This is an unhealthy condition, and to obtain production and hold good operatives, it must be counteracted by an attempt on the part of management to make it worth while for the individual to produce.

The cost of living must be reduced through increased production and elimination of excessive waste of material, which will mean a real return to the working people for the dollar will then buy more of the necessities of life. That is, of course, the ultimate accomplishment, but how can the worker be interested in it and induced to work toward that end? It must be through some scheme that he can understand and that will benefit him in a concrete form.

We hear a great deal today of the elimination of the operatives' interest and creative ability due to standardization and machine production. This I do not believe is true. The operative has much opportunity to express himself, and it all depends upon the individual. It is my opinion—and it has been proven in practice—that the majority of employees take an interest in the particular work that they are doing, and will use their best endeavors, provided it is recognized and acknowledged by the management.

Other than labor, there are four main elements affecting cost: production, material, waste and overhead expense.

The employees are thoroughly familiar with these terms, but aside from knowing what they are, they mean nothing to them. What does the employee at the present time care how much material he uses in manufacture—how much waste he makes or what production he turns out in a day or a week. He gets the same wage either way.

If we measure all of these items, we can make it well worth while for the operative to consider them very carefully.

Increased production may be rewarded by a 50 per cent increase in pay for all production over a certain standard.

The consumption of materials and waste made may be measured and the saving under or over a predetermined standard split 50-50 with the employees.

The overhead expense may be measured and any saving as compared with predetermined standards split 50-50 with the employees.

A bonus system based on these principles is bound to interest the employee for he can see the direct advantages and the real opportunity to make substantial bonuses.

In setting the production bonus, a standard production is arrived at and a bonus of 50 per cent paid for any production over and above the standard. This is where the usual bonus system stops, but of what benefit is an increase in production if it is spasmodic? To make a real saving, the production must be increased and maintained in an even flow; therefore it is necessary to offer a substantial reward to the operatives maintaining the standard, week in and week out. This bonus is usually paid at the end of each month to the operatives maintaining production during that period. This tends to eliminate spasmodic effort and brings the operatives down to a consistent and even effort. It will also eliminate to a great extent the present practice of mill hands working four or five days each week and laying off the rest of the time, for such a procedure means a substantial loss to them in dollars and cents which they are reluctant to give up, once they become interested.

A theoretical discussion of a principle is of no value unless it is backed up by practical application; therefore I will outline the application of these principles as installed in one of the representative underwear mills and tabulate the results attained.

To pay a bonus we must first determine the standard upon which to base it. The bonus system is based on two distinct classes of endeavor. First, an endeavor to increase production, and second, an endeavor to save material, waste and overhead expenses.

Production Bonus.

I will take up first the production bonus. To be effective, the bonus must be arranged so that every employee in the plant, from the watchman to the manager, may share in it. There are three classes of employees to be considered:

Class 1. Employees whose individual efforts may be measured and compared with a standard.

Class 2. Employees who operate in groups, all working on the same article, and whose efforts must be measured by group or gang production.

Class 3. Employees who do not actually work on the article of manufacture, but assist the productive workers. This class includes the manager, office employees, superintendents, foremen, foremen's assistants, etc.

Determining the Production Standards.

EMPLOYEES—CLASS 1.

This class includes piece workers and day workers, whose individual production may be measured. Every operation performed by this class of workers must be analyzed and by means of time study and records of past performances, an average standard of production set for each. The standards of production must not be set too high or too low, but at a level that can be reached without special endeavor by an average operator.

In the finishing room of an underwear mill, the units of production are measured by the piece work rates. Therefore the finishing operatives bonus is directly measured by the total weekly pay. Form 1 illustrates the method of figuring the bonus. At the top of the form is provided a space for recording absent time, which is not the fault of the operator, for it would not be fair to penalize an oper-

ator for sickness or unavoidable absence. From the total weeks possible working hours, 48 in this instance, is deducted the excused hours of absence, 8 hours, which leaves 40 hours as the standard bonus time for the operator.

On a flatlock operation, the bonus standard is $23.00 for a 48-hour week; therefore the standard for 40 hours would be 40/48 × $23.00 = $19.18, which is the amount noted on Form 1, opposite "Total Standard Units." The

PIECE WORK WEEKLY REPORT

Name Jane Smith

No. 101 Week Ending March 30 1920

Time Absent or Lost and Excused by Foreman.

DATE	FOREMAN SIGN—REASON FOR ABSENCE	HOURS
March 29th	Sickness J. H. G.	8

Possible Weeks Working Hours	48
Weeks Working Hours minus Excused Hours	40

PIECE WORK EARNINGS

Name of Operation	Style	Dozens	Rate	Amt.
Flatlock	2110	30	23¢	6 90
	2113	28	18¢	5 04
	632	40	26¢	10 40
	634	20	20¢	4 00
Special or Day Work Allowed	—	—		
Total Regular Pay				$ 26 34
Total Units Produced				$ 26.34
Total Standard Units				$ 19.18
Units Over Standard				$ 7.16
Bonus				$ 3.58

FORM 1. THE PIECE WORK WEEKLY REPORT.

actual piece work earnings of the operator are figured on Form 1 under "Piece Work Earned." (Note: The operatives themselves make out these slips and turn them in to the office at the end of each week to be checked.) The actual piece work pay is therefore the total units produced. Subtract the Standard units from the actual units produced, which gives the units over standard of $7.16. One-half of this amount is paid to the operatives as a bonus. In this way, the operative is allowed to make substantial bonus which costs the company nothing, for the overhead of a plant is never less than 50 per cent and the increase in production represented by $7.16 means a decrease in the overhead of at least 50 per cent of that amount, or $3.58, which is the amount paid to the operator as a bonus.

To illustrate that the money paid as bonus represents a corresponding saving to the company:

Economy Bonus.

METHOD OF FIGURING THE OVERHEAD PERCENTAGE OF EXPENSE.

Total Department Expense .....$ 600
Total Productive Labor 1000
Per cent of Expense to Productive Labor 60%

Due to the bonus, a 10 per cent increase in production is made. The figures will then be:

Total Department Expense $ 600 (No change)
Total Productive Labor ... 1100 (Decreased 10%)
Per cent of Expense to Productive Labor 54½%

The labor bonus amounts to one-half of the increase in productive labor, or ½ × $100 = $50.

Under the old conditions the expense cost for $1000 of productive labor equalled $1000 × 60% = $600.

Under the bonus conditions the expense cost for $1000 of productive labor equals $1000 × 54½ = $545. Thus the saving in expense cost equals $55.

The saving in expense is $55 and the amount paid in bonus equals $50.00. Therefore the company has made an actual saving of $5.00.

The overhead of a plant is usually over 100%, which means that the actual saving to the company is about equal to the amount paid in bonus, for as the per cent of expense goes up, the saving in expense correspondingly increases.

The procedure is the same for all operations and classes of individual effort. The units of production are always based on the rate of pay so that the bonus and the actual pay roll may be figured simultaneously. Very little extra clerical effort is therefore necessary to figure the bonus; in fact, on recent installations of this bonus scheme, no extra clerks were employed.

EMPLOYEES—CLASS TWO.

This class includes piece workers or day workers who operate in groups, where it is impossible to measure the individual effort, but where the production of the group as a unit may be measured. The dye house of a knitting mill may be best taken as an illustration.

From past performance and analysis, a weekly standard of production is determined, together with the amount of labor necessary to obtain this production.

The production standard for a bleach house is 19,940 pounds per week. 19,940 pounds per week to be finished with present number of hands. The total weekly bleach house payroll is $165.50. Thus the Standard Labor cost per 100 lbs. = 83 cents.

The bleach house employees have two opportunities of making a bonus. First, the production may be increased, and second, the lazy or shiftless operatives weeded out. Either will lower the labor cost per 100 lbs., resulting in a bonus to the operatives. The operatives will watch each other and eliminate the employees who are not doing their share, when it means money in their collective pockets.

The actual labor saving is easily measured by taking the difference between the actual labor cost per 100 lbs. and the standard labor cost per 100 lbs. This amount is multiplied by the actual pounds of cloth actually produced, giving the total saving in labor. One-half of this amount is paid to the operatives as a bonus and distributed among them in proportion to their weekly wages.

Again a substantial bonus is paid to the employees and an equal amount saved by the company.

MILL No. 1. EXPENSE ANALYSIS

Ex. No.	DEPARTMENT	THIS YEAR Month of	THIS YEAR Period to Date	LAST YEAR Same Month	LAST YEAR Same Period	THIS YEAR Month of	THIS YEAR Period to Date	LAST Same Month
	Finishing.	MARCH						
	Labor Bonus	17923	17923					
	Foreman & Assts.	165409	451227					
	Freight	4119	11253					
	Misc Exp.	4560	58139					
	" Supplies	32	4227					
	Mch. Parts	25293	60052					
	Checks.	8363	13526					
	Mch Fix & Repair	66837	191901					
	Mch Shop. Labor	1073	3439					
	Exp.	310	705					
	TOTAL DIRECT EXP	293919	812392					
	Shore Fxd. Chgs.	11583	34749					
	" M.L.E. Power	10279	22285					
	" Gen. Mill.	142345	449298					
	TOTAL DPT. EXPENSE	$458126	$1318724					
	TOTAL PROD. LABOR	594761	1481464					
	% EXP. to PROD LABOR	77%	89%					
	NORMAL % Exp to Prod Lab.	85%						
	Total Normal Exp	505546						
	Abnormal Exp.	+ 47420						
	PRODUCTION BONUS							
	Total Individual Bonuses	$12765						
	Total Fin. Dpt. Labor	602191						
	% BONUS.	2.12%						
	ECONOMY BONUS							
	½ Exp. Saving	$237.20						
	½ Waste "	203						
	½ Trim. Mat. "	2850						
	Total Saving	$2677.3						
	Total Fin Dpt Labor	602191						
	% BONUS	4.44%						
	TRIMMING MATERIALS	$						
	Total Trim Mat Used	1263.00						
	Total Units Produced	1310						
	Trim Mat Cost per Unit	96¢						
	Normal Trim. Mat. Cost per Unit	$1.00						
	Total Normal Trim Mat.	1310.00						
	Abnormal Trim Mat.	+ $53.00						

FORM 2.

EMPLOYEES—CLASS THREE.

This class includes the superintendent, office employees and general labor throughout the plant. The plant is divided into manufacturing departments. The foreman and general labor of each department are paid a bonus in proportion to the bonus earned by the productive workers of that department. Take the finishing department as an example:

Total Productive Finishing Labor $5021.00
Total Bonus Paid to Productive Workers . 251.05
Per cent of Bonus to Productive Labor 5%

According to this calculation, the foreman and general labor in the finishing department are paid a 5 per cent bonus on their weekly wage.

In the same way, the superintendent and office employees are paid a bonus in proportion to the bonus earned by all of the productive workers of the plant.

This is a fair method of figuring the bonus for indirect workers, for with the cooperation of the indirect employees, the productive workers can make a greater bonus.

Economy Bonus.

The cutting down of the actual material used in the manufacture of an article, and the saving of overhead expenses, are items which to a more or less extent are under the control of the employees. If standards are set and the operatives made to understand that they will be paid 50 per cent of all savings made, surprising results are attained.

Overhead Expense Bonus.

Expense Analysis, Form 2, best illustrates the method of measuring the economy bonus. The factory is first divided into definite manufacturing departments, and an

expense analysis sheet made up for each department. All department expenses are listed and totaled under the item "Total Department Expense."

The next item is "Total Productive Labor." The expense is divided by the labor, arriving at the month's per cent of Expense to Productive Labor. Next comes the item of Normal per cent of Expense to Productive Labor, which is the basis of the expense bonus. It is arrived at through an analysis of past experience and what the per cent of Expense should be under normal conditions. The total productive labor is multiplied by the normal percentage of expense, arriving at the Total Normal Expense, which is the amount of expense the department should have incurred during the month. The difference between the Total Normal Expense and the Total Department Expense gives a measure of the overhead profit or loss each month. For the month of March, as illustrated on the Expense Analysis, this amounted to a saving of $474.20, half of which is paid to the operatives as a part of the economy bonus.

Material Bonus.

The trimming materials are figured as follows: The value of the actual thread, buttons, sateen, etc., used during the month are determined from the actual deliveries of these materials from the storeroom. We then figure from production reports the unit dozens produced during the month. From tests we have figured the standard trimming material cost per unit dozen; therefore the total unit dozens produced multiplied by the standard or normal trimming cost per unit dozen will give the value of trimmings that should have been used for that number of dozens. The difference between the normal amount and the actual amount used will give the loss or gain on trimmings. In March, as shown on the expense analysis, Form 2, a saving of $57 was made, half of which is paid to the operatives.

Jane Smith
No 301

BONUS

Items marked X shows where Bonus was earned.

Increased Production, -	X
Saving Expense, -	X
Saving Waste, -	
Being In Each Week, -	X

TOTAL BONUS, $ 16.82

FORM 4. THE BONUS ENVELOPE.

Waste Saving Bonus.

The saving in waste is figured in the same way as that used for trimming materials.

Half of each of these savings are listed under the Economy Bonus on the Expense Analysis form. They are totaled, giving the Total Economy Bonus. This total is divided by the total department labor, arriving at a percentage of economy bonus to the labor of that department.

This percentage is noted on the Payroll Form 3 under Economy Bonus, and is applied to the wage of the employee to determine the amount of economy bonus.

The regular weekly pay of the employees is figured on the Payroll Form 3. Since the bonuses are distributed to the operatives in proportion to the wage earned, the individual operatives bonus is easily figured in the columns provided for that purpose, and illustrated on the payroll form.

The bonus is paid once a month, about the middle of the month following that in which the bonus is earned. The bonus payroll envelope, Form 4, is provided for the bonus payroll. An X is marked opposite the items for which the bonus is paid.

A scheme of this kind, to be successful, must be approached from the right angle, and attractively presented to the employees of the plant. First, the standards must be worked out and the scheme thoroughly outlined. Then a meeting of the employees is called. At this meeting, the scheme will be outlined in detail to the employees, and concrete examples worked out on a blackboard, in an endeavor to make it as clear as possible. After the bonus is started, a well directed advertising campaign must be carried out by means of bulletin boards and posters such as the ones illustrated herewith:

BULLETIN I MARCH 1st, 1920.

BONUS

Are You Working for the Bonus?

REMEMBER-

Four Ways of Making Bonus

FIRST
Increased Production

SECOND
Gives a Bonus for Individual Effort
Saving Materials and Supplies
Gives a Bonus Due to Decreased Expenses
Gives a Bonus Due to Decreased Material Costs

THIRD
Decreased Waste
Gives a Bonus Due to Decreased Material Costs

FOURTH
Making a Bonus Each Week
Gives an Extra Bonus for Maintaining the Standard

YOU are now working on the MARCH BONUS.—Be sure you beat the STANDARD.

EVERY EMPLOYEE of the plant can make a BONUS.

EVERY DOLLAR saved means more for you.

COME TO US with your Bonus-Earning Suggestions for we want you to make a Bonus.

Watch the Bulletin Board for Bonus-Earning Possibilities and details of the BONUS PLAN.

BULLETIN 2.

ECONOMY POINTS

FOR

THE FINISHING ROOM

Increase YOUR share of the BONUS

1st—Exercise care in the use of thread by stopping machine when garment is finished. Don't tie the pedal down. Stop your machine when getting your dozens ready. *Don't Waste Thread.*

2nd—Exercise care in the use of needles.

3rd—Tie up dozens securely to prevent waste from odds and ends.

4th—Don't use an oil can for a squirt-gun. Apply a reasonable amount of oil only to such parts as need oil.

5th—Edgings, facings, pant bands, button stay cloth, are costly and every inch that you save will show up in the bonus. A half inch of facing saved on each vest of a day's production would face 25 dozens without additional facing cost.

6th—Don't waste buttons.

7th—Be careful about keeping all garments clean. A soiled garment makes a "second," which means more expense.

8th—*Help Us to Get and to Keep the Producers.* Every learner hired means not only added expense but lessened production, so it is to your advantage to help us keep our experienced operatives.

9th—Work every day.

10th—As you increase production you will decrease expense, which will

INCREASE YOUR BONUS

New bulletins should be posted at least once a month. In this way the bonus is continually and attractively brought to the attention of the operatives. A proposition of this kind is new to the operatives and they must be educated to it by descriptive and constructive propaganda.

The tabulation below is made up of figures taken directly from actual payroll and production reports, showing the increase in production resulting from an installation of this bonus scheme. The finishing department of an underwear mill is the neck of the bottle; therefore an increase in the finishing production is representative of the mill as a unit.

APRIL 7, 1920.

TABLE 1.

FINISHING DEPARTMENT.
Production and Piece Work Pay.

Weeks Ending	No. of Operators	Dozens Unions	Finished Vests, Pants, etc.	Dozen Units	Weekly Piece Work Pay
1919					
Dec. 27	70	336	1283	1955	608.00
1920					
Jan. 3	70	400	1350	2150	654.00
" 10	74	462	1780	2160	800.00
" 17	72	484	1236	2204	930.23
" 24	73	504	1280	2288	992.56
" 31	71	421	1463	2305	1032.75
				6 | 13062	
				2177—Note No. 1.	
Bonus started here.					
Feb. 7	68	508	1455	2471	1022.29
" 14	70	505	1205	2215	1045.51
" 21	69	553	1391	2497	1109.98
" 28	71	630	1578	2838	1192.10
Mar. 6	74	561	1387	2509	1213.63
" 13	73	757	1251	2665	1191.35
" 20	72	635	1261	2531	1179.92
" 27	72	787	1232	2806	1170.61
				8 | 20532	
				2566—Note No. 2.	
				2177	
				389	

18% Increase in Production under Bonus System

Note No. 1—Average production for six weeks previous to starting bonus system.

Note No. 2—Average production for eight weeks operating under bonus system.

Tabulated below are the accomplishments of two individual operators:

TABLE 2.

FINISHING DEPARTMENT.

Flatlock Operation — Individual Operator — Nellie Holiat

Weeks Ending	Piece Work Pay	Bonus
Dec. 13	20.94	
" 20	23.69	
" 27	16.93	
Jan. 3	17.49	
" 10	14.88	
" 17	23.00	
" 24	22.30	
" 31	23.85	
	8 | 163.08	
	20.38—Note No. 1.	
Bonus started here.		
Feb. 7	25.44	1.22
" 14	27.10	2.05
" 21	27.61	2.30
" 28	27.94	2.47
Mar. 6	27.28	2.14
" 13	27.93	2.47
" 20	28.00	2.50
" 27	27.58	2.29
Apr. 3	26.94	1.87
	9 | 245.82	
	27.31—Note No. 2.	
	20.38	
	6.93	
	34%—Note No. 3.	

Note No. 1—Average pay for eight weeks previous to starting bonus system.

Note No. 2—Average pay for nine weeks after starting bonus system.

Note No. 3—Increase in production of 34% under bonus system.

APRIL 6, 1920.

TABLE 3.

PRESSING DEPARTMENT.
Individual Operator (Agnes Milner.)
Individual Production and Piece Work Pay.

Weeks Ending	Dozens Pressed, Vests	Pants	Suits	Weekly Piece Work Pay.	Bonus
Dec. 13	288	195	99	22.95	
" 20	309	208	110	24.80	
" 27	236	116	133	20.80	
Jan. 3	203	180	123	21.35	
" 10	273	167	152	25.39	
" 17	207	160	185	24.36	
" 24	180	143	145	20.37	
" 31	210	157	175	23.70	
				8 | 183.72	
				22.96—Note No. 1.	

	Bonus started here.				
Feb. 7	221	150	192	24.77	.89
" 14	228	143	183	24.10	.55
" 21	206	163	167	23.34	.17
" 28	210	165	190	24.97	.99
Mar. 6	207	220	160	25.43	1.21
" 13	155	181	213	25.50	1.25
" 20	167	175	216	25.79	1.39
" 27	190	166	215	25.99	1.49
				8 199.89	
				24.98—Note No. 2	
				22.96	
				2.02	

9% increase in production under bonus system.

Note No. 1—Average pay for 8 weeks previous to starting bonus system.

Note No. 2—Average pay for 8 weeks after starting bonus system.

To describe the application of a principle, a specific instance must be cited. In this article, I have shown the application as applied to the knitting industry, but the same principles apply to all industries. The difference being merely in the detail of measuring production, material standards and overhead expenses.

Putting up Signs.

Too many managers look upon signs as the remedy for all the ills and ailments that bob up in a mill. They think that when a sign had been put up, that ends it.

But what would a manager say to his own wife if, when the cook did a bad job of sausage frying or biscuit baking, she put a sign up in the kitchen warning the cook against repeating the offense?

The way to straighten out most things that are not right is to do it in a frank, face-to-face way. Signs are deadly cold. They arouse antagonism when antagonism should be avoided. By putting the message over personally, by mixing in a little human interest, by making it clear why the order is being given, the desired results can be obtained ever so much more smoothly.

Why not go easy on this sign business?—*From the August number of Builders.*

The new Eveready instruction book, put out recently by the Oxweld Acetylene Company, 3640 Jasper Place, Chicago, Ill., is an excellent treatise on every-day oxy-acetylene welding and cutting. Not since the company issued its Oxweld Manual, which has gone through two complete editions, has Oxweld experienced so spirited a demand for a trade publication. The little volume is a compact and handy brochure (5" x 8") containing 55 printed pages, inclusive of illustrations and drawings. It covers the field of every-day applications in a remarkably clear and concise treatment and in language that is easy for the beginner to grasp, and it is at the same time invaluable to the experienced welder and cutter. The booklet is distributed free.

World Cotton Conference.

Travel arrangements for those who are to attend the World Cotton Conference at Liverpool and Manchester, England, June 13 to 21, 1921, have been placed in the hands of Henry L. Mulligan, W. H. Eaves Steamship and Tourist Agency, 10 Congress Street, Boston, Massachusetts, and they invite correspondence with any who may decide to make the trip.

While it is impossible at this early date to announce a definite program, the following details may no doubt be of interest:

Arrangements are in progress for securing a steamer to sail from New York on or about June 1, to land at Liverpool, England. The name of steamer and particulars of accommodations, with rates, will be announced as early as possible.

For the period of the conference, reservations have already been secured at the principal hotels at Liverpool and Manchester. Applications for such reservations will therefore be received by them and dealt with in the order received.

For those desirous of visiting other parts of Europe after the conference, carefully prepared tours will be offered, visiting the battlefields, France, Belgium, Switzerland, Italy, etc. The amount of strictly first-class hotel accommodation is limited and this condition must control the number of bookings accepted for each tour. The rate will include hotel reservations, transportation, a liberal number of sight-seeing excursions and motor trips, care of baggage and the services of an experienced business manager accompanying each party. Among the tours to be offered are the following:

Tour 1 (16 days)—London, Ostend, (Flanders battlefields) Antwerp, Brussels, Paris (Chateau Thirry and Rheims).

Tour 2 (23 days)—Edinburgh, Trossachs, Glasgow, English lakes, London, Ostend (Flanders battlefields), Antwerp, Brussels, Paris, (Chateau Thierry and Rheims).

Tour 3 (37 days)—Harwich, Hook of Holland, The Hague, Amsterdam, Brussels, Antwerp, Ostend (Flanders battlefields), Metz, (Verdun, St. Mihiel, The Argonne) Strassbourg, Lucerne, Interlaken, Lake Geneva, Chamounix, Paris, London.

Tour 4 (58 days)—London, Amsterdam, The Hague, Antwerp, Brussels, Ostend (Flanders battlefields) Metz, (Verdun, St. Mihiel, The Argonne) Strassbourg, Lucern, Interlaken, Lake Geneva, Italian Lakes, Milan, Venice, Florence, Naples (Pompeii, Sorrento, Amalfi, Capri) Rome, Pisa, Genoa, Nice, Monte Carlo, Avignon (Pont du Gard, Nimes), Paris.

Return steamer reservations will be secured from ports in England, the Continent, and the Mediterranean, as desired, so that, before starting on the outward journey, all travel arrangements for the entire trip may be concluded.

It will assist considerably in completing the plans to advise Mr. Mulligan at this time as to the likelihood of any party contemplating the trip, giving the probable number in the party.

There's nobody quite so busy as the man who doesn't want to do something else.

Fourth Southern Textile Exposition

A real "increased production and efficiency" exhibition will begin in Greenville at 12 o'clock noon, October 18 and continue until and including October 23. These are the dates which have been officially set for the Fourth Southern Textile Exposition in Textile Hall, an event to which southern mill men are looking forward with much anticipation.

With the experience of three previous Shows as one of the guiding elements, each exhibitor expects to have at this year's Show a better and more comprehensive display than ever before. And the manufacturers of equipment appertaining to textile manufacturing have evinced more interest in the coming Show than in any previous one. Scarcely had the announcement that a Show would be held this year been made before scores of applications for space began pouring into the office of the management of the Exposition. Another evidence that the value of the Southern Textile Exposition is being more generally recognized and that the Fourth Show will go over strong is the fact that the "big machinery boys" are going to exhibit this year and will be at Greenville in full force. Every loom manufacturer in the country has a large reservation. Every one proposes to feature that which will tend to increase the production and efficiency of textile plants.

The period of time intervening since the last Show has given the manufacturers of textile machinery, equipment and appliances a good opportunity to introduce changes and improvements in their particular products. In a great many instances manufacturers have gotten to work and the equipment, thus improved, will be at the Show with sufficient representation. Also, during this period, many new "production increasers" and "efficiency promoters" have been devised and placed upon the market and the Fourth Exposition will be utilized by their producers as a medium for placing them before the textile men. Then, too, quite a number of organizations have had their inception during the past year and these will be on hand to get their products better known by mill men. In fact, it can almost be said that practically everything used about a cotton mill, from the time the stock is in the bale until it is in a finished product state, will be on display, on demonstration or in operation.

There will be the regular lines of cotton mill machinery with the latest production-increasing and labor-saving attachments and devices; power equipment; electrical equipment; engineering specialties; textile belting; water softening apparatus; chain drives; power scrubbing equipment; shipping room supplies; ball and roller bearings; belt lacers and even a folding ladder—in fact, almost every kind of product whose producer caters to the textile trade. Those features named comprise only a part of what will be at the show; they are given merely as examples. When one considers the assortment of equipment, etc., needed in the operation of a mill, together with the number of manufacturers of each product, each striving to make his product the best in his field, an idea of the value of this show in presenting the latest types may be secured.

The plan of sending the superintendents and foremen

to the Exposition in relays, which has been carried out by a large number of mills in connection with the three previous Shows, will undoubtedly be adopted by an additional number this year. In this manner, all the operating heads are given an opportunity to attend the Show and yet all of them are not away from the mill at any one time.

It is stated by the management that ample rooming accommodations will be provided for visitors to the Exposition. The Imperial Hotel, whose annex was completed in time for the last Show, will lodge a large number of the delegates and exhibitors; the Ottaray will also be patronized to a large extent as will be the four other hostelries in Greenville. In addition, in order that every visitor will be comfortably provided with sleeping quarters, the management of the Exposition advises that a housing committee will have several hundred rooms which will be placed at the disposal of those who desire accommodations in private homes. A small charge will be made to the occupants of these rooms to relieve them of any feeling of embarrassment. The people of Greenville are responding readily to any requests made of them in this particular and no prospective visitor need stay away from the Exposition for fear of not having sleeping quarters.

Those desiring accommodations in private homes may obtain them by writing in advance to the Manager of the Textile Hall. It is obvious that these rooms in homes cannot in any event be assigned except by arrangements for each person made in advance. Those who wish to engage them are requested to write a separate letter to the management giving names, business connections and dates of arrival. In the event of cancellation made for cause there will be no charge, as these rooms will be put at the use of the Exposition Management through the public spirit of citizens, but it is requested that no arbitrary cancellations be made.

In addition to the various restaurants and cafes already in operation in Greenville, it is quite probable that temporary lunch rooms will be maintained by the different churches contiguous to the Exposition Building.

Of the Exposition Building itself, little can be said that is not already familiar to the mill man who has personally attended an Exposition there, or who has heard or read much concerning it. The second largest auditorium in the South, it stands as an imposing tribute to the earnest work and untiring zeal of a number of men in whose minds the idea of having a textile machinery show in the South originated and through whose ceaseless efforts this idea has taken definite shape until a $250,000 building has been erected which houses one of the two textile machinery exhibitions in the country.

The general offices of the Exposition Company will be found just at the left of the main entrance on the first floor of the building. Either at these offices or at the Information Bureau which will be located directly across the entrance hall from these offices, any needful information may be obtained not only concerning the Exposition, but also about the location of restaurants, rooming houses, hotels, train schedules and other facts desired by the visitors to Greenville. Local and long distance telephone facilities will also be provided in the buiding.

A new and unique feature of this year's Show will be the installation in the managerial offices and in the booths of a large number of exhibitors of an automatic interior telephone system. This will be provided by the Screw Machine Products Corporation. It will doubtless prove a great convenience to those in whose booths stations are installed as they will thereby be enabled to keep in touch with the management and the various activities of the building as well as with other exhibitors.

One of the important features in connection with the Fourth Show will be the semi-annual convention of the Southern Textile Association, on the last two days of Exposition Week, October 22 and 23. This will undoubtedly prove an additional drawing card for the Show as this association's membership includes several hundred mill superintendents and foremen. A large number of these men will take advantage of the coincidence of the occasions and will come early in the week to visit the Show, devoting the last two days of the week to the association meetings.

It has also been announced by President William G. Sirrine of the Exposition Company that an invitation has been extended to the Board of Governors of the American Cotton Manufacturers' Association to hold their fall meeting in Greenville some time during Exposition Week. Realizing the value of the Exposition, this body has held meetings coincident with two previous Shows. Up to this writing it had not been stated whether or not the invitation had been accepted.

A number of excellent social features have been scheduled for the Show which will be novel and interesting. Entertainment of a most pleasing calibre is always provided at the meeting of the Southern Textile Association and this, together with the functions arranged by the Exposition Entertainment Committee, will be unusually attractive. Among the entertainment facilities will be a summer garden, tastefully decorated, located on the top gallery floor of the Exposition Building. It is probable that this garden will be used for convention and assembly purposes. Also, some form of stage entertainment will be provided every evening of Show Week, it is stated.

President Sirrine has announced that the Garber-Davis orchestra has been secured for the entire week, under the leadership of Jan Garber. This is one of the South's most attractive orchestras, and has its headquarters in Washington, D. C. A musical program will be rendered every afternoon and evening at Textile Hall.

Chief among the entertainment features will be a dance, complimentary to the members of the Southern Textile Association and exhibitors, which will be held every evening from ten to twelve o'clock in Cleveland Hall on Main Street which has been leased for the occasion. Admission to the association members and the exhibitors will be free. A nominal fee will be charged for others, except ladies, who will be admitted free of charge. A prominent lady in Greenville society with a number of chaperones will have charge of each dance. Cleveland Hall will be the social gathering place for all visitors to the Exposition and a committee on introductions will be on hand to see that everybody gets acquainted. A reception will be given by the Greenville Association of Commerce to the Southern Textile Association, it is also announced.

Manifestly it will be an "increased production and efficiency" show with plenty of entertainment and good times added. We'll meet you there!

Aniline and Its Uses in the Dyeing and Calico Printing Trade

BY WILLIAM B. NANSON.

PART SIX.

Vat Color and Sulphide Color Resists.

The vat and sulphide color printing pastes are particularly suitable for the production of fast color resists under aniline black on account of their being applied in a strongly alkaline solution. In order to preserve the resists from injury by the black, a little acetate of soda and a little extra "hydrosulphite" may be added to the printing pastes. In a general way, however, these additions are not necessary, because the colors usually contain more alkali and reducing agent than is required for their fixation. In such cases the excess resists the aniline black and neutralizes its oxidizing action.

The Ciba, hydanthrene, and sulphide colors are used either with or without the addition of sodium acetate.

Usually the vat and sulphide colors are used as resists under printing covers of aniline black. It is true—they may be also employed to "discharge" previously padded cloth, but practical difficulties have prevented their extensive use in this direction. When combined with insoluble Azo color resists, the vat dyestuffs and sulphide colors yield a wide variety of effects, of great fastness and brightness, under aniline black covers.

It may be said that this process is not in general use, but it is, nevertheless, a very valuable one for the production of fast colors on shirtings and dress goods: the colors are very fast and withstand all the operations of washing and laundering exceedingly well. The following recipe will serve as a type of a sulphide color resist:

Violet—25 grams thiogene violet BD extra; 150 water; 50 caustic soda 77° Tw.; 25 hydrosulphite conc powder; 100 China clay paste 50 per cent; mix and add 200 grams British gum paste, 20 per cent; dissolve at 122° F. and add to 350 grams caustic soda 77° Tw. and 100 grams light British gum. Heat the whole to 122° F. and cool before use.

This preparation must be printed on the bleached cloth and dried, then "cover" or pad in aniline black; dry and steam twice for 2 or 3 minutes in the rapid ager, wash soap and dry.

When applying the vat dyestuffs any of the alkali hydrosulphite pastes may be used for the printing, and acetate of soda may be added as desired. We have already in another place given recipes for these colors and we need not repeat them here. The colors are printed on white cloth, covered with a pattern, or a pad, of aniline black steamed, allowed to air until reoxidized, and then washed and soaped. Ciba colors should be soaped at the boil or chromed at 185° to 212° F.: These operations bring about the full development of the color and add to its brilliancy.

Printing Aniline Black.

Aniline black is an oxidation product of aniline, and it is formed on the fibre by printing a thickened mixture of a soluble aniline salt, an oxidizing agent and one of several oxygen carriers, which invariably consist of a salt of some metal capable of existing in two states of oxidation. After the goods are printed and the cloth dried they are exposed to the action of air or steam, under the oxidizing influence of which the printed parts of the cloth assume a dark green appearance which is due to the formation of a product known as "emeraldine," which is an oxidation product of aniline, intermediate between aniline and aniline black itself. To convert this emeraldine into black it must be further oxidized by a run through the solution of bichromate of potash (or soda) which peroxidizes it into still more highly oxidized body known as "nigraniline" and this oxidation may be carried still further into what is known as ungreenable black.

The salts of emeraldine are green, but where treated in alkaline or soap solutions they are converted into the base which is of a deep blue color of such intensity as to be virtually a black. An insufficiently oxidized black rapidly regains its original green color when exposed to the action of the acid-reducing agents so often present in the air and for this reason it has been found necessary to push the oxidation of the aniline beyond the stage represented by nigraniline. This may be accomplished in a variety of ways but a run through bichromate of potash is the most generally convenient one found in practice. The nigraniline obtained by treating emeraldine in a *cold* solution of bichrome is a very deep violet black base, the salts of which are also of the same deep blue. It turns green much less readily than emeraldine but it is none the less very susceptible to the action of mineral acids and reducing agents, both of which reconvert it into the salts of emeraldine. In view of this, a *hot* solution of bichromate is always used where practicable, because it exercises a more energetic oxidizing action, and produces a black very fast to acids, alkalis, air, soap and light. It is probable the aniline is oxidized beyond the state of nigraniline.

It is a fact pretty well known to practical dyers and printers, that the presence of free aniline is essential to the formation of an absolutely ungreenable black, but whether this indicates that the nigraniline combines with a further quantity of aniline in the final reactions, or whether the aniline simply neutralizes the acidity of the lower products of oxidation, is still unknown. There is no doubt that neutrality does help the formation of an ungreenable black, and in conjunction with energetic oxidation at a comparatively high temperature (225° F.) it allows of a good fast black being obtained without the necessity of subsequent chroming.

This fact is taken advantage of in certain styles of prints which do not permit of after-chroming. A little free aniline is introduced into the printing color together with an excess of some neutral oxygen carrier [$K_4 Fe(CN_6)$], and these by neutralizing the acids liberated in "ageing" or steaming not merely tend to the production of an ungreenable black, but also prevent, to a great ex-

tent, the tendering of the printed fabric during the process of oxidation.

An aniline black printing color consists of three distinct parts: (1) a soluble salt of aniline, (2) an oxidizing agent, and (3) an oxygen carrier. The aniline salt employed is generally the hydrochloride though the tartrate, lactate, chlorate and other salts are sometimes used for special purposes. The only oxidizing agent used in practice is chlorate of soda. It comes into the market in a state of great purity, and is generally preferred on account of its cheapness and solubility—two qualities which render it more economical and efficient than chlorate of potash. The oxygen carriers are, however, more numerous but, as a rule, about four only are used to any appreciable extent, i. e., vanadium chloride, copper sulphocyanide, copper sulphide, and yellow prussiate of potash. The blacks produced by these salts are called respectively the vanadium black, copper sulphocyanide black, copper sulphide black and prussiate black. There is also another called the "chromate black" on account of the quantity of chromate of lead it contains and these five are the only oxidation blacks out of the many that have been tried that have stood the test of actual practical application. And, with the exception of Greens recently patented process and the Diphenyl black of M. L. & B., the above combinations hold undisputed sway in actual practice.

(1) Vanadium black. In the presence of the requisite quantity of chlorate of soda, one part of vanadium is sufficient to convert two thousand parts of aniline into black. Vanadium chloride is the salt of vanadium usually used to produce this effect and this chloride may be made as follows: Vanadium chloride 1 per cent—10 grams vanadate of ammonia; 70 grams hydrochloric acid, 30 per cent; 40 grams water; 7 grams glycerin. Heat until a pure blue is attained; then make up with water to 1000 grams. A solution one-tenth of this strength (1/1000) is usually employed in practice and can be reduced from stock as required.

The quantity of vanadium used varies according to the class of work in hand; 30 grams of 1 per cent solution of the chloride per kilo of printing color is about the average, but for fine patterns which allow of oxidation at a higher temperature, 5 grams is a usual quantity to allow.

As vanadium blacks contain no solid matter, they print much better than either the copper or the chromate of lead blacks; but, on the other hand, they oxidize much more rapidly and the black is apt to form in the color paste, and as the black thus formed before printing would only adhere to the cloth mechanically and would be washed off in soaping it is of the first importance that the vanadium chloride be added to the color only immediately before its use.

In addition to its good working qualities, vanadium black is peculiarly well adapted for printing along with steam alizarin reds and pinks. The slight trace of metallic vanadium which it contains has no effect on the alizarin colors, and if it is printed in lightly engraved patterns it may be steamed with safety after a run through ammonia vapor subsequent to its development by ageing in the rapid ager. The following recipe has been found to give good results in general practice: 100 parts starch; 80 parts British gum; 570, water; 40, chlorate of soda; 20, cotton seed oil; boil, cool and add cold—90 parts aniline salt; 20, aniline oil, and 5 parts of 1 per cent vanadium chloride solution previously mixed with 95 parts water.

After printing and drying, this black is developed by running through the rapid ager 2 minutes at 176° to 194° F., or it may be hung in an ageing room at 89.6 to 96.8° F. until it has become quite black, after which it may be chromed. If it is developed by a passage through the rapid ager at a high temperature (203° F.) it is not necessary to chrome it, though, of course, all aniline blacks are improved by chroming and it is best therefore not to omit the chroming unless it injures other colors that may be printed along with the aniline black.

(2) Copper sulphocyanide black. Blacks made according to this process oxidize more slowly than the sulphide of copper or vanadium blacks, and they withstand a much longer steaming besides which they work a great deal better in the printing. In view of this, it is rather surprising that they are not used more than they are. They are made as follows: 150 grams starch; 90, British gum; 530, water; 20, oil; 40, chlorate of soda; boil, cool and add—25 grams ammonium chloride dissolved in 20 grams of water; 80 grams aniline salt; 20 grams aniline oil; and 25 grams copper sulphocyanide.

Print, dry and either age in ageing room, pass through the rapid ager, or steam fifteen minutes, chrome and soap. If printed along with other colors that require a long steaming, (1 hour) the cloth, after development of the black, must be passed through an atmosphere of ammonia before being subjected to the prolonged action of hot steam. This applies to all aniline blacks printed along with steam colors.

(3) Copper sulphide black. This black is by no means easily worked. It is always liable to attack the doctors if the latter are not varnished, and even then their edges are always more or less rapidly affected so that they require constant attention and refiling to keep them in good working condition. But still, it is a valuable color, and if carefully prepared and worked as cold as possible the oxidation of the sulphide to sulphate in the printing paste may be reduced to a minimum, and the edge of the doctors be preserved comparatively. One great disadvantage of sulphide of copper is that it is extremely apt to stick in the engraving no matter how carefully the colors may have been prepared and therefore it is always replaced by the prussiate or vanadium blacks whenever the style of work permits of it.

An excess of free aniline is always allowed in copper sulphide blacks to overcome the tendering of the fiber and to promote the formation of ungreenable black during the chroming process. A little ammonium chloride is also frequently added to aid in the reactions. The following copper sulphide black recipe is in practical use: 150 grams starch; 80, British gum; 528, water; 40, chlorate of soda; 35, cottonseed oil; 5, methyl violet, (to tint color).; boil, cool and add—95 grams aniline salt; 17 grams aniline oil; 50 grams sulphide of copper (30 per cent paste).

Print on white cloth, dry, and pass for 3 minutes through the rapid ager at not above 149° F. If desired the development of the black may be more slowly but quite as effectively done by hanging the printed goods in an ageing room for 10 to 24 hours. This method is usually adopted when the black is printed along with aluminum

or iron mordants and it develops very well at the temperature of a cool chamber 131° to 140° F. Ordinary goods, after ageing or steaming for three minutes are afterwards chromed in a hot solution of 1 per cent bichromate of potash or soda.

(4) Prussiate black. For ordinary printing the following recipe yields excellent results: 100 grams starch; 20, British gum; 61, potassium ferrocyanide; 707, water; boil, shut off the steam and then add 28 grams chlorate of soda, cool and add 84 grams aniline salt which will dissolve in the cold solution. After printing, this black is developed by a run of four minutes through the rapid ageing machine at a temperature of at least 203° F. If the goods are now passed through ammonia vapor to thoroughly neutralize any free acid that may be present they may be steamed with perfect safety for about one hour in the continuous steamer. This is an advantage which allows of this black being used in conjunction with a large number of "steam" colors. Although this black contains a large amount of iron, it may be used without fear with steam alizarin reds and pinks if care is used in the printing and if a "starch" roller is interposed between the black and the red or pink rollers.

In the case of simple black and white patterns the prussiate black is developed, as in the case of dyed goods, by running the goods through a rapid ager followed by chroming and soaping. The prolonged steaming is only necessary when it is required for the ordinary steam colors printed in combination with the black; it is not at all necessary to the development of the black, but it does improve its shade in some respects and it certainly acts as a preventive of the greening action of acids and reducing agents.

Should ferrocyanide of ammonia be used in place of the same salt of potash, and an excess of it used so as to completely neutralize the acids liberated during the process of steaming a black may be obtained that is absolutely ungreenable and this without any after treatment with bichromate.

The color paste for printing made with ammonia ferrocyanide does not, however, keep very well and must be used as soon as made and color made from the same salts of soda possess the same disadvantages. It is not understood why this should be so, but it is well known in practice and this has prevented the sodium salt from being used in printing although it is used sometimes when dyeing solid colors.

The main advantages of prussiate blacks seem to be that they have no tendering action on the fiber and that they work quite as well as any other color in printing and that they will keep well for several days if stored in a cool place. They cost more to produce than the other aniline blacks, and do not yield quite the same shades but the facility with which they may be applied more than offsets these minor defects and it is safe to say, that at this present writing prussiate blacks are used more largely than any other in the calico printing trades.

(5) Chromate black. This black can be used as a steam color in the ordinary way, because, under proper conditions it has no tendering action on the cotton fiber. It is made from aniline salt, chlorate of soda and lead chromate, with sometimes an addition of ammonia chloride. In this combination the lead chromate plays a dual part, namely, that of an oxidizing agent on the one hand and of a neutralizing agent on the other. Sometimes a copper salt is added if the rate of development is too slow.

Chromate black, (1) 80 grams starch; 595, water; 100, chrome yellow, 40 per cent paste; boil and add 100 ammonium chloride; cool a little and add 25 chlorate of soda; cool completely and add 95 grams aniline salt and 5 aniline oil. After printing, the goods are steamed for fifteen to twenty minutes without pressure and then washed and soaped. It is not necessary to chrome them.

Chromate black (2), 60 grams starch; 590, water; 100, lead chromate (chrome yellow); cool a little and add 25 grams chlorate of soda; cool completely and add 100 grams aniline salt and 25 copper sulphide, 30 per cent paste.

After printing, steam for fifteen minutes, wash and soap. If the black is combined with any steam colors it is necessary to pass the goods through ammonia vapor after the first steaming and then steam again for about one hour. Sometimes the chromate and sulphocyanide of copper blacks are mixed together for steam work and give a much better black than the chromate black can give alone, which latter at its best produces a poor black of a dull bronze appearance.

The large quantity of solid matter in chromate blacks tends to make them work rather badly, but, when they are carefully made they are more especially suitable for the printing of fine patterns in which a crisp, clear defining line is essential and as they require no subsequent chroming they can be used for a larger variety of styles than any other blacks.

If an addition of a small proportion of paraphenylenediamiene is made to all aniline black colors, whether for dyeing or printing, it will have the effect of making them less liable to turn green. Sometimes an aniline black made from chlorate of aniline and sulphide of copper is used for certain styles.

Chlorate of aniline. 450 grams chlorate of barium; 300, aluminum sulphate; 1,500, water; heat to a boil and after complete precipitation, cool to 104° F. and add 470 grams aniline oil. Stir well and use the filtrate, which is a solution of aniline chlorate. The printing paste is made as follows: 850 grams chlorate of aniline solution; 100 grams starch; boil, cool and add 50 grams copper sulphide paste, 25 per cent.

Print the foregoing and develop as for copper sulphide black. We might say here that in all cases where aniline black is printed on oiled cloth the proportions of aniline salt and chlorate of soda should be increased, and no aniline oil should be used. The oil acts as a resist and gives a poor black unless these precautions are used.

In 1907 A. G. Green patented a process for the production of aniline black by which the use of an oxidizing agent in the black mixture is entirely dispensed with. The process is based upon the fact, first observed by him, that aniline, in the presence of an oxygen carrier and a small percentage of a para-diamine or a para-amidophenol, is easily oxidized to emeraldine by the mere exposure to the air. Further it was discovered that by this new process it was possible to effect the oxidation of aniline in the basic state; so that the chief cause of the tendering of the goods, which in the regular aniline black colors is caused by the liberation of the mineral acids into a free state, is entirely overcome, with the result that

the original strength of the fabric is unimpaired. In this black it is not even necessary to use a mineral acid at all, because the formation of the black is carried out quite as well though perhaps more slowly in the presence of organic acids alone. However, mineral acids are cheaper and as it is not essential that they should be in excess as is quite necessary in ordinary aniline black colors they can be used to advantage, either alone or in combination with an organic acid. Mr. Green recommends formic acid.

He has found the most efficient oxygen carrier to be cuprous chloride, being in a lower state of oxidation than cupric chloride, it does not act upon the aniline so readily, and in consequence, the decomposition of the black mixture is retarded to such an extent that it remains clear and serviceable for a considerable length of time. In actual practice the cupric salt ($CuCl_2$) is first added to the mixture and is then reduced to cuprous chloride (Cu_2Cl_2) by the further addition of the requisite quantity of sodium metabisulphite together with an amount of ammonium chloride sufficient to keep the copper salt in solution.

A. G. Green's process may be applied on identically the same lines as the other processes—the cloth, after printing or padding may be developed either by hanging in a warm moist atmosphere in an ageing room or by a passage through a rapid ager, or by a more prolonged steaming. It is then chromed or not, as required, and then washed and soaped.

This process is already in use for dyeing plain blacks, but it has not as yet found any very extended application in the printing trade, however, a fairly good result may be obtained along the following lines: 700 grams thick starch, tragacanth paste and 130 grams ammonium chloride, warm together and after cooling add 50 grams copper chloride ($CuCl_2\ 2H_2O$), and 15 grams metabisulphite of soda, cool and add 60 grams aniline oil, 4 paraphenylenediamine; 20, hydrochloric acid, 30 per cent, and 21 formic acid, 90 per cent. Print, age 3 minutes at 203° F., hot chrome, wash, soap, etc.

There are various advantages claimed for the oxidation of the blacks by the air: (1) In the first place they are more economical owing to the more complete utilization of the aniline. (2) They do not attack the fiber. (3) They are more stable than other aniline black mixtures owing to the absence of energetic oxidizing agents. (4) The rate of production is increased. (5) The absence of all noxious vapors makes the process more healthy for the operatives.

One very valuable property of all aniline blacks is the ease by which they may be reserved and discharged by means of alkalis and neutralizing and reducing agents, as we have fully shown in the parts devoted to "discharges" and "resists."

Of the thickenings spoken of in these articles they may be made as follows:

Tragacanth thickening 6 per cent: 600 grams gum tragacanth, 9400 grams cold water. Allow to soak for 24 to 30 hours, then boil until smooth.

Albumen solution 50 per cent: 1000 grams egg albumen; 1000 grams cold water; dissolve cold.

Starch paste: 1500 grams wheat starch, 5500 grams water, 2200 acetic acid, 9° Tw., and 300 grams cotton seed oil.

British gum thickening: 350 grams British gum, 650, water; boil and cool. If the gum is acid it must not be boiled.

Frequenty do instances occur in which it is found necessary that the productive ability of a mill be increased to meet an increased demand for its product. One means of accomplishing this is by erecting a new additional mill with more and properly laid out machinery. Another way is to "scrap" the equipment being used and replace it with new. However, it is found in some cases to be neither feasible nor advisable to adopt either of these methods. In such instances the logical course remaining is to introduce methods which will result in the more efficient operation of the machinery already installed. Each specific trouble encountered needs its particular remedy as no one remedy will—singly—raise production to a maximum. However, it is comparatively easy—fortunately—that the mechanical causes of limited production in a textile mill can be traced to the point of origin and these causes can, in the matjority of cases, be removed by properly altering the operating conditions. This practice has been so experimented with and developed upon that many features of efficiency have become to be recognized as standards.

Great opportunity for increasing production through improvement is offered by six phases of textile mill operation, namely, the machines, character of drive, light, power plant, air conditioning and arrangement of departments. It has been proven that these items, through proper changes, offer the greatest possibilities for an increased quantity and a higher quality. Among the advantages resulting from such changes will be: increased production per operative and per unit of power, lower cost per unit of production, increased quality, few rejects and seconds, lowered maintenance and greater freedom from labor trouble.

These facts are brought out in a 20-page booklet being sent out by J. E. Sirrine & Company, Greenville, S. C., entitled "Picks to the Minute" which takes up in detail the six important phases referred to, explaining how the best results can be obtained in the laying out of a new mill and in the replacing and readjusting of an old mill. Treating each subject separately, the booklet contains much information of interest compiled by this well known firm of engineers and beyond a doubt will be of value to the mill facing the problem of how to secure more production. Copies will doubtless be furnished to those requesting them.

"Trekking—Being the Story of a Migration, its Cause and its Result," is the title of an interesting booklet just published by Rickard and Sloan, Inc., 25 Spruce St., New York. This well known organization of advertising specialists have consistently confined their work to mechanical and electrical products, and this move to new and larger quarters, after eight years in the Evening Post Building, is but one more demonstration that satisfactory service produces an additional clientele as well as the satisfied customer it was originally intended to please. A copy of this booklet may be had on request.

Domestic Science and Saleratus

BY A. W. WILLIAMS.

Home economics and domestic science are two things that have a very important place in the textile world. These two studies along with other vocational studies are among the talked of things in the progressing mills of the South today. Domestic science, frequently referred to as "kitchen science," or the science of properly operating a kitchen, is of vast value in improving the morale of the worker.

Good food, properly cooked and served, in a good home, properly taken care of, and where home economics reduce waste and expense, represents a combination that makes for a satisfied mill worker. Happy men make better workers, stick to their jobs, and cause little or no trouble. Textile workers generally come from families of textile workers, and their children become textile workers, with the result that improvement of conditions in the home makes for better workers in the years to come.

That this is a fact was brought out forcibly in a recent discussion by J. B. Young, of the Jackson Fibre Co., Bemis, Tenn., a concern closely identified with the Bemis Bag Co., one of the largest bag manufacturing concerns in the world. The Jackson Fibre Co., owns its town bodily, that is it has a large acreage built up with a fine mill and other plants, excellent homes for the workers, schools, churches, Y. M. C. A., and other similar buildings, amusements, etc. The town is owned and operated by the company, and its hundreds of employees are apt to live most of their lives at home, and raise their children in a town that does nothing other than a textile business. With the exception of a few who go out into the world, secure college or other educations and go into other lines, the majority of the children raised in Bemis, Tenn., will become textile workers.

Mr. Young stated that some years ago he noticed that many children and young employees looked anemic or poorly fed. They were not robust, didn't have the right amount of strength or weight., He realized that they were receiving good wages, quartered in extremely good homes, and given all of the advantages that any of the most progressive of companies have been able to devise to make workers in an isolated district happy. Bemis has all of the advantages of any industrial company town in the country. The workers undoubtedly had the money to buy good food, and records of the stores showed that they bought food and good food. Something was wrong, and it finally occurred to Mr. Young that the food was not being properly cooked.

In such textile towns many of the wives are wives of textile workers, and were textile workers before they were married. In many cases wives are still textile workers, and have families which they are taking care of, probably the wife and husband both working in the mills, and perhaps some of the older children.

The girls enter the mills when comparatively young, and never learn much about cooking, or if they do learn, they merely learn to cook as "Ma cooks," and "Ma" is generally a blamed poor cook. The girls marry and settle down, and probably without the assistance of even a cook book, they start cooking meals for their respective husbands, and later for the children of the union. Poor cooking is handed down from mother to daughter, and there can be no improvement in conditions unless someone shows them how.

Mr. Young finally decided that if he could establish domestic science classes, and get the women to attend them, he would improve conditions. However, the women wouldn't take much interest in the movement. About the only ones who came to the school were young girls who expected to marry somebody, and it would take years to get results in educating merely the unmarried girls.

It was finally decided to send the domestic science demonstrators or teachers into the homes. They would drop in on the housewife about the time she was starting a batch of biscuits, and by persuasion and diplomacy interest her in allowing them to show her how to make biscuits. The first batch would delight the husband and family, and if she hadn't mastered the principle, she would come around for more information, if the expert didn't call again.

Perhaps it should be explained that there are but two kinds of bread in the average mill town, one is light bread (biscuit) and the other is corn bread, (cornpone). The biscuits made by the uneducated are usually mere saleratus "sinkers," which are almost indigestible in the first place, and which are hardly fit to eat the next day. This sort of biscuit will turn green and mouldy within a day or two after being made and are thrown out if not consumed.

Corn bread in the old days was merely a mixture of water, salt, meal, etc., and eggs were unknown. When the domestic science teachers undertook to put eggs in it, the housewife would say: "My people won't eat it with egg." However, they did eat it, and after eating it a couple of times they wouldn't have anything else.

Of course there were some people, who were hard to handle, but a tactful demonstrator could usually prevail on the housewife to try the method out, and give it a chance to make good.

After the biscuit and cornbread matters are straightened out there are other lines to be taken up, but by the time the housewife learns how to make biscuits and cornbread, she will become enough interested to attend the school.

Today there are two domestic science classes at Bemis, one in the morning for the girls, and one in the afternoon for the women. They are all learning how to cook, and many have learned. It has reached a point now where good cooks are known by the smells coming from their kitchens, and there is an increasing interest being shown in being a good cook. Also the good cooks will be of more interest to the young fellows and the woman who doesn't care to learn how to cook is having it forced upon her.

If Bill and his wife go to Jim's for dinner, and Jim's wife puts up a rattling good dinner, far better than Bill is in the habit of getting, Bill is going to take Mrs. Bill to task on the subject, or he is going to grouch, and find so much fault with her cooking that she will decide that it is better to learn how.

Again, as women learn how to cook and become author-

ities on the subject they trade information, and the woman who doesn't know how to cook is a wall flower when such discussions come up. The women who want to learn will go to the woman who knows how and ask for information, and by getting interest working on the subject, it gradually spreads.

Mr. Young stated that before domestic science was taken up there were enough "sinkers" or mildewed biscuits thrown out each day to make it possible for two men with wagons to keep hog pens well supplied on the garbage, most of which was biscuits. Today there are not enough biscuits thrown out to feed six chickens regularly.

This would come under the heading of Home Economics, as it represents a big saving in waste, and waste of costly food products today means smaller cash for other purposes and dissatisfaction. Learning how to market properly, how to divide up the income so as to feed well, to dress well, to put money in the bank, and to have amusement, and enjoy life at the same time, represents home economics.

Domestic science, home economics and vocational education along the lines of the daily work will make for happy and satisfied workers, who are getting somewhere, living well, raising stronger and better children, and supplying the industry with better men and women, better fitted for life's work. It also means better educated workers who get up in the world more rapidly.

Happy, satisfied, home owning workers are not strikers as a rule. It is discontent which causes strikes, and which results in trouble. Bolshevism hasn't a chance in a satisfied, contented community, and the more level headed men will stamp it out before it gets a start.

There has been a noted improvement in the health of the workers in the mills of the Jackson Fibre Company, and the children are stronger, sturdier, rosier, and better all around. The anemic look is rapidly passing away and a healthy and well community has taken the place of a sickly, anemic one. Solid biscuits of the sinker type can't improve the health of a worker. They are indigestible, and overwork the stomach.

Of course there are other methods of keeping up interest in the work, such as offering prizes for the best biscuits, best cakes, pies, cornbread, etc., and in some such enterprises the millers will be glad to offer prizes, where the contest is in connection with their particular brand of flour. Better baby contests also create a greater interest in raising better and healthier children. In a town like Bemis the babies of today are the workers of tomorrow, and it is worth while to raise the babies right and school them properly for the day to come.

It has been found necessary to go into the homes and interest the housewives in the project before you can get them into the school. However, that it is worth while can be seen in the fact that the company mentioned is now spending $12,000 for a new home and equipment for the Domestic Science Department.

Notes on Mercerization

BY RAFFAELE SANSONE.

In the plant described in a former article, a certain quantity of the caustic soda was completely lost during the neutralizing operations with the weak acid, increasing the price of the mercerizing process and reducing the quantity of the caustic soda which may be recovered from the goods after mercerizing.

A very ingenious plant, Fig. 1, based on the action of the steam under pressure as a dissolving medium for the caustic soda, has been designed to avoid this. The principle of this plant is as follows: It consists principally of a strong iron case on the bottom of which is arranged an inclined holder which, by the vertical walls "c," is divided into a certain number of troughs in which the material passes during its treatment; the last of these is the highest and is followed by the other troughs which are lower in height until they reach the opposite extremity of the apparatus. Just above is placed another series of iron sides, "e," which, however, do not reach the bottom of the other set and which are so placed that the liquid, flowing from one trough to the other, is compelled to pass below them before it can enter, thus having a zig-zag course. Through a similar arrangement, the disadvantage is avoided of the liquid, used for the rinsing process, running only in the upper portion of the bath of each trough without mixing properly with the whole contents thereof.

Iron or glass guiding rollers, "f," "h," and "k," are arranged in the troughs, and between these rollers are placed at a certain height, "g," turned at a regulated speed by pinion wheels placed on the outside of the apparatus and driven by a fixed and loose pulley and a belt working on an overhead transmission.

In the iron case are located the iron walls, "P" and "Q," the purpose of which is to seclude a space where the entrance of air is forbidden. For properly accomplishing this purpose, the ends of these walls dip in the rinsing baths of the first and last rinsing troughs, already

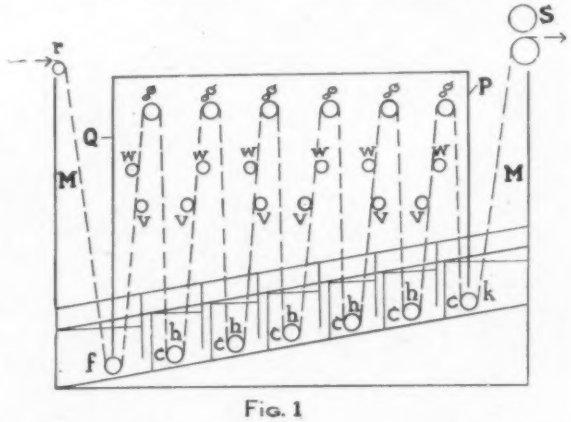


Fig. 1

referred to, while their upper portions are fitted with a cover, which has a small cock for expelling all air present in the interior of the apparatus during the steaming.

The material ,"M," coming from the mercerizing plant, enters through a glass or iron shaft, "r," and through guiding roller, "f," in the first trough; from here it is

carried upwards on the first roller of series "h," and after this forward in zig-zag fashion on both series of rollers until the roller "k" is reached. It is then led between the nip of a pair of squeezing rollers "S" and out of the apparatus.

For assisting, to the greatest possible extent, in the rinsing out process conducted in this apparatus, perforated horizontal steaming tubes, "v," are applied, each of which touches only one side of the cloth at a time and treats the surface of this in its full width, while the other is being rubbed in a slightly higher position against special glass or steel rollers, "w," both the steaming and rubbing arrangements are fitted to produce a tension on the material.

Steaming tubes have their holes on the sides closest the material being treated and all steam passing through these last beats with great energy and effect upon it, compelling a good portion of the caustic soda lye to come out of the fiber so that when the surface of the cloth is pressed against the rubbing rollers, all lye accumulated on its outside is compelled by the steaming to fall down into the troughs placed just below. The double action of the rubbing and steaming is so arranged as to take place alternately on the wrong and right sides of the fabric; in this way a very energetic washing out of the caustic soda lye is possible.

Before reaching the squeezing rollers, "S," the material is subjected to a fresh water spray which is made to fall into the last trough and mixes there with the caustic soda lye extracted from the cloth, moving forward after this into the following troughs in zig-zag fashion, thereby supplying the troughs below with all the rinsing fluid required.

As the fabric runs through the apparatus in an opposite direction to that followed by the rinsing bath, a portion of this liquid is carried up from each trough, and the jets of steam and the rubbing arrangements react upon it very forcibly, pulverizing it and sending it back again into its original bath together with a certain quantity of weak lye formed by the condensed water of the steam. The first bath contains very strong lye washings and these are usually carried out through a pipe for recovering the caustic soda they contain. The succeeding troughs contain less caustic soda, as they approach the opposite extremity of the apparatus. The concentration of such baths can, of course, be regulated in each case by increasing or reducing the quantity of rinsing water introduced into the apparatus.

In this apparatus the material comes first to be reacted upon by a lye of a certain strength, which is further strengthened by that extracted from the material, and enters the second trough with about its weight of the first bath, being ridded there through the action of the weak lye bath and through the steaming and rubbing action of another portion of caustic soda, much of the rest being eliminated in subsequent operations and during the final rinsing and squeezing through the rollers "S." The material is thus left in a sufficiently purified condition for submitting to any bleaching, dyeing or printing operations which may be necessary.

There is no doubt that for economizing in space and for being better able to utilize the heat developed through the steam required for the treatment an apparatus constructed on the principle shown in Fig. 2 would offer a distinct advantage.

This consists of a high, rectangular iron structure, "V," divided into six stories by horizontal iron plates; each story containing a long shallow glass or iron vat. Two of these vats, those contained in stories 3 and 5, are on one side of the structure, while 2, 4 and 6 are on the other side.

These vats have a lower series of guiding rollers, a, c, e, g, i, and k and an upper series, b, d, f, h, j, m, and have a supply and escape of rinsing fluid that is independent in each case. The lower portion of the apparatus has two entrance baths, A and B, the first of which is filled with the bath of the first treating vat in story 1, while the second is supplied with continually changed hot condensed water. On one side of the apparatus is the material leading out arrangement or compartment W, the interior of which is rendered air-tight by its wall dipping in bath B.

The cloth is led in by roller r and after passing in the first bath, A, several times up and down on glass or clay

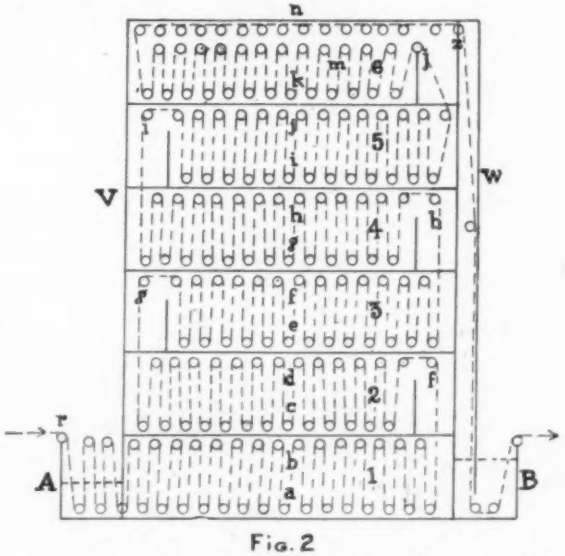


Fig. 2

rollers, is entered in the vat in story 1, and is treated there in the rinsing bath for some time by running up and down on the upper and lower series of guiding rollers a and b, issuing from these to mount in the apparatus on cylinder f, and from this into the second bath of treatment in story 2; it is then taken upward in close succession on the guiding rollers g, h, i, j, and in the baths in stories 3, 4, 5 and 6, where it is kept in continuous contact with the different rinsing baths by the upper and lower series of guiding rollers e, f, g, h, i, j, k, m, until the upper portion of the apparatus is reached.

At this point the material mounts upward for the last time on the horizontal series of rollers n and is then led out of the apparatus on the narrow-diametered glass or iron cylinder z and down the channel W into the bath of exit B.

A very thorough extraction is thus possible that can be assisted by submitting the cloth during its passage to the action of steam under a small pressure, spurted at intervals on the material. The first three baths of treatment would only be warmed in this instance to 50 to 70 degrees

Centigrade, while the others are only allowed to be heated by the heat developed in the lower stories and which mounts upward in zig-zag fashion, passing out very slowly through channel W. Besides this heating, there is also that of the hot lye baths transported by the cloth running from bath to bath.

This plant undoubtedly offers a great advantage, for not only can a good portion of steam be saved by its use, but it is also possible to conduct the caustic soda extraction more thoroughly than by any other method, avoiding later washing and scouring of the goods.

During the last 15 or 20 years attempts have been made to mercerize cotton cloth without first subjecting it to a passage through the tentering chains, and many patents have been taken in different industrial countries for the protection of quite a number of apparatus in which the stretching of the material was undertaken by other means. However, very few of these experiments have brought any satisfactory results in actual practice because, for some reason or other, the stretching was never sufficient for producing the desired effect.

In one of these apparatus the shrinking of the material, brought about by the strong alkali, was avoided as much as possible by keeping the cloth under a certain tension on special guiding rollers and drums. The impregnation in caustic soda and the following rinsing and pressing of it in the material took place in this instance against three guiding rollers. The more difficult task of stretching was entrusted entirely to five cylinders placed in two rows, on which the cloth was pressed by its own contraction.

The strong friction exercised by the material on the cylinders doubtless avoided much of the shrinking that would have otherwise taken place but it was not sufficient for producing the required width and the best effect, and therefore only imperfectly or half mercerized goods could be obtained. The machine therefore found no wide employment for practical purposes; it led up, however, to the construction of other apparatus and to a more thorough study of the subject later on.

Although this study has not given, thus far, those practical results that could allow a successful and effective competition against any of the better mounted and constructed mercerizing ranges, there is no saying that the experience gained may not be used in the near future for a certain number of transformations in the mercerizing plants themselves which employ tentering chains, perhaps leading up to the possibility of placing these under still nearer perfect conditions than are possible at present.

In some of the German tenters, constructed before the war, a very short pair of endless chains was adopted, and the caustic soda recovery process, which is a basis of all modern mercerizing plants, was in these machines carried out in a series of iron vats, placed at the extremities of the chains. This led to the production of excessive quantities of weak lyes, although the space required for mercerizing plants equipped with longer tentering chains was very much reduced.

In another mercerizing plant the short tenter was substituted for one of greater length, but which was so arranged as to occupy comparatively small space. This form of tenter offered certain advantages as it permitted a very large production in a very little space, which is another point not to be neglected in any modern mercerizing concern. In this plant the cloth was first impregnated by passing on the ordinary padding machine, and was then placed before the circular spreading device. In this the pairs of chains, instead of being worked as in the ordinary English plants, were passed around two wheels under a certain tension so that a correct stretching could take place. After this the material was squeezed between the rollers of a hydraulic mangle.

On leaving the squeezing mangle the cloth was taken up by another pair of chains which carried it in a stretched condition through the washing operations carried out in a special vat placed at the back of the plant and where it was also subjected to a steaming. The recovered lye was collected in this instance in a separate trough ready for utilizing the alkali it contained.

Such a machine, as can be understood, gave very valuable service when a thorough recovery of the caustic soda lye was not desired, but the squeezing and washing to which the material was submitted was hardly sufficient to extract the last traces of caustic soda, which had to be removed by a subsequent souring and washing. The plant had at least one big advantage over many others; this was the comparatively small space required for the working of very large batches of material. There is no doubt but that by slightly modifying its construction and disposition, and by applying a special recovery arrangement, the caustic soda recovery could be conducted as well as with the long ranges; both the benefit of the reduced space occupied and of the increased caustic soda recovery would thus be combined to a great advantage.

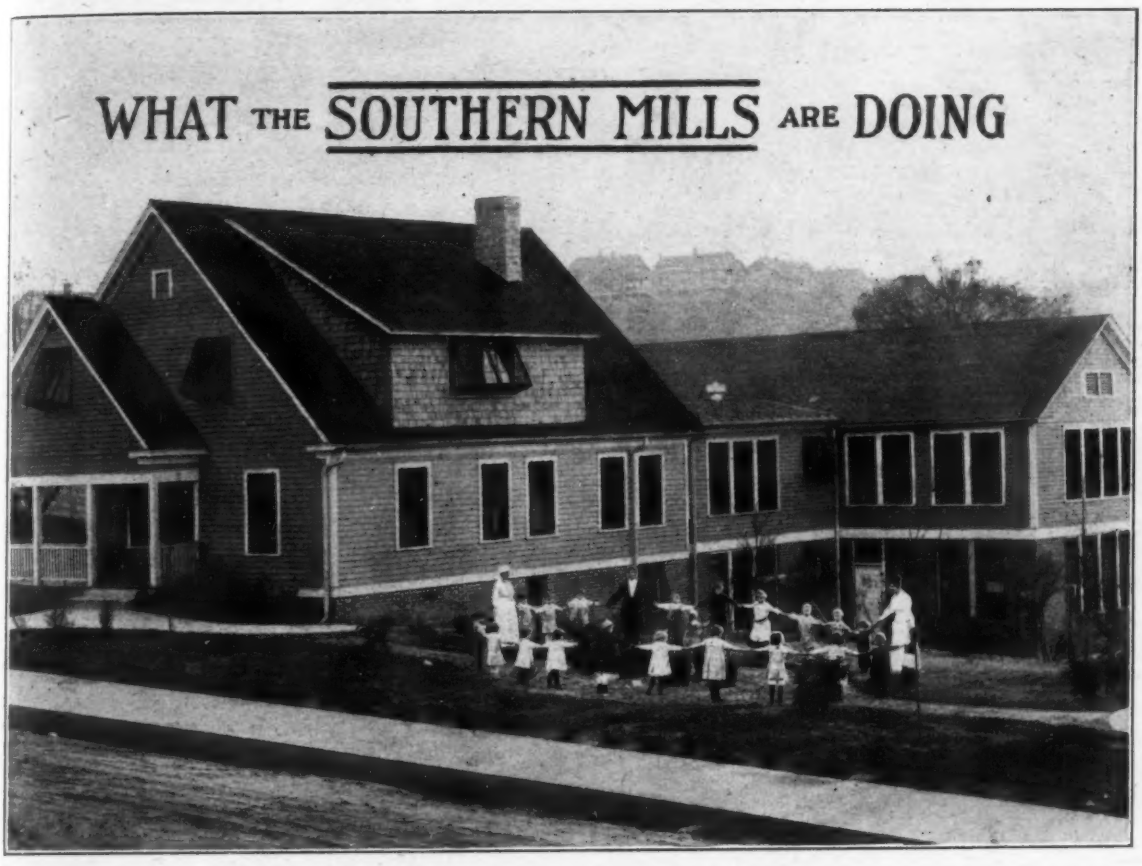
Of all the methods of mercerizing described, the one based upon the use of the long tenter is probably the one most preferred and applied. Whether the modification suggested will or will not have a larger application than is now the case remains to be seen.

To meet the demand for a condulet having an unusually long cover opening and big wiring chamber, the Crouse-Hinds Company of Syracuse, N. Y., have designed a new series known as the new Mogul Series of condulets which are shown in their Bulletin 1000 N.

These condulets are designed to avoid kinking heavy wires or cables when pulling in or feeding through a conduit system, and to afford ample space for making splices or taps. Mogul condulets though liberal in their proportions do not materially affect the general outline of the conduit system. Their hubs have integral bushings and tapered threads. Fastening screw holes are located at the ends of the cover openings. They are made in eight types, each type in eight conduit sizes ranging from one to four inches.

There are four sizes of composition and cast iron covers, each size being common to two sizes of Mogul condulet bodies. The composition covers are made with from one to nine wire holes; also blank, which can be drilled by the user as required. The cast iron covers are made in two types; with gasket, or without gasket. The gasket is made of round rubber, cemented into a groove in the cover. The cover fastening screws are furnished with and secured to the cover.

WHAT THE SOUTHERN MILLS ARE DOING



THE DAY NURSERY BUILDING, PACOLET, S. C.

The Pacolet Manufacturing Company spends about $10,000 a year on community service work. This work was begun at the Pacolet Mill in the fall of 1916. Today Pacolet is considered a model mill village. Schools, day nursery, laundry, ice and storage plants, district nursing, girls club, bank, Y. M. C. A., parks, play-ground and other features of community work are pointed to with pride by both mill officials and employees.

Victor M. Montgomery, president of Pacolet Manufacturing Company, says that he regards it "a cold-blooded business proposition." He says that it pays in keeping satisfied help. "Which is better," he asks, "to keep the mill in operation through this work, or have a man hired on the outside to keep up the labor supply?"

Pacolet Mill village attracts attention through the appearance of its streets and homes. The type of houses the operatives dwell in are a credit to their designers. Contagious diseases have been stamped out through the public health service. The policy is to get increased service through good health. "Prevention is better than cure;" this is what is impressed upon the employees.

In the Fall of 1916 and the Spring of 1917 Pacolet village showed an epidemic of measles 400 cases; scarlet fever 200 cases; dysentery among babies, ten deaths in one week of the spring of 1917. There were also a number of severe cases of pellagra and typhoid fever.

In the Fall of 1919 and the Spring of 1920, the third year of the public health work, there were but two cases of measles and two of scarlet fever—all imported. There were but a few slight cases of dysentery, with no deaths; only two cases of tuberculosis. There were no decided cases of pellagra and none of typhoid. Infant mortality was negligible.

Today contagion is confined to the home where the disease originates. Disease prevention and home cure, as taught by Miss Belle Fuller, the registered nurse in charge, lessen mortality, save loss of time caused by illness and improve the morale of the community.

First aid is given by a trained nurse at the first aid room in the Girls' Club. Office treatment is given at the same place, free of charge, by the community nurse. The office was opened in October, 1916. It is in charge of a registered nurse employed by the company. This nurse lives at the Day Nursery and is ready at call. During the year 1919-1920 this registered nurse made 3,892 visits and gave 7,619 office treatments.

The Day Nursery at Pacolet was established in 1918. It is equipped with 75 beds, has two wards, an indoor playground, kitchen, dining room, store rooms, nurses bedrooms, sitting room, mothers' reception room, office, shower baths, baby baths, laundry, linen room, etc. The sanitation and plumbing are modern and up-to-date. The working corps of the Day Nursery includes: superintendent, dietitian, two attendant nurses, cook and colored maid. The community nurse supervises the Day Nursery in addition to giving first-aid and visiting the homes.

The feeding of the children is adapted to the age and

PACOLET (S. C.) MILL SCHOOL BUILDING AND PUPILS.

special need of the child and is under the direction of the dietitian.

Sick babies are isolated and sent home, where they are kept under care of the doctor and trained nurse.

During the month of May there were 62 children enrolled in the Day Nursery. The average attendance was 39. This represented 1.6 children cared for per mother released. The mother's only obligation is that she work in the mill. The cost to the mother is nothing. The cost to the company varies with the number of children, mothers released, cost of provisions and help.

That the Day Nursery is appreciated is shown by the increasing attendance and its popularity with the mothers.

An important feature of the community service work, as Mr. Montgomery views it, is in instilling a spirit of civic pride. "My idea," he says, "is to get the people to want to do things to beautify their homes, their lawns, their streets and to grow gardens. In these undertakings the Company goes them fifty-fifty."

"I was being shown the points of interest about Richmond. After I had been taken to many places I asked to be shown Hollywood. I had seen this cemetery before, but

GIRLS CLUB ATHLETIC TEAM AT PACOLET.

I wanted to visit it again. Upon my return to Pacolet village a delegation of operatives expressed a desire to form a Civic League. The League was organized, and as a suggestion for something to begin with I told them of Hollywood. I asked them to go and take a look at their own cemetery. They came back with the announcement that they were going to improve it. They went to work, and I put the Company's teams in to help them. As a result, Pacolet has a beautiful cemetery."

At an overseers' supper, early in June, a Village Beautiful Campaign was instituted. It was planned to organize

PACOLET NURSES. MISS BELLE FULLER, HEAD NURSE, TOP ROW, CENTER.

the various streets of the village into units with the purpose of beautifying and keeping clean the entire town. The people were called together in one of the homes in each street and a manager for that street named. An evening a week was set apart for work on the yards. The

BATH FOR INFANTS, PACOLET DAY NURSERY.
OLDER CHILDREN USE THE SHOWERS.

landscape gardner, a Belgian employed by the Company, was on hand to offer suggestions. The object was to see that every yard was beautified with flowers and shrubs. These were furnished at half price.

Mr. Montgomery believes better results are obtained by the new way than the old. In speaking along this line he says: "The old way was to jack up the 'Super.,' the 'Super.' would jack up the 'bosses,' and the 'bosses' would get in behind the operatives. This did not get one anywhere. The trouble was, we began at the wrong end. When a man or woman is comfortably situated they take a deeper interest in their work and things run more smoothly. I passed by a house that had been built in a niche on the hillside. The red clay was falling against the

A PARLOR IN THE GIRLS CLUB.

building and the surroundings were anything but inviting. I thought, if the fireside, the place sacred to a man's heart, is made a decent place to live in, he will do better work. We can take the improvement from the home to the mill, but never from the mill to the home. Accordingly architects were employed and comfortable and attractive homes designed."

The school system of Pacolet Mill village includes three

A REST ROOM IN THE GIRLS CLUB.

buildings for white children—primary, intermediate and high school—and one negro school building. The total enrollment is 600, and the average attendance is about 400. The coming session the schools will open with a teaching force of fifteen. Miss Katherine Dozier, supervisor of educational work for the Pacolet and New Holland mills, assists in the school work and will make the sixteenth teacher.

The pupils furnish their own text books. The high

INFANTS WARD, DAY NURSERY. A SIMILAR WARD IS MAINTAINED FOR OLDER CHILDREN.

school course covers tenth grade work, and pupils can enter college with some conditions. Domestic science is taught from the fourth grade up in the white schools. Evening classes are held twice a week for the mothers and mill workers.

The school rooms are well equipped, all having modern desks and appliances.

There is a library at the schools with about 300 volumes. The Girls Club also has a reading room, including a library of several hundred volumes and magazines of interest to young women.

A public playground is now being laid out and graded. It will have all modern equipment for supervised play and will be in charge of one of the teachers.

A grandstand, seats and lights have been recently provided in one of the parks of the village for outdoor twilight services during the summer months.

The laundry established by the Company at the Pacolet Mills does washing for 237 families. The average cost is $1.20 per week per family. Ten persons are employed in the plant, which just about pays running expenses. The equipment is the most up-to-date on the market.

OLDER CHILDREN IN THE DAY NURSERY.

Pacolet also has an ice and cold storage plant and this is run on the same basis as the laundry—not to make money, but to accommodate the employees and charge enough to cover running expenses.

As an example of the thrift inspired by this service work Mr. Montgomery cites the record of the village bank. This bank was organized March 15th, 1917. On the date of organization employees had on deposit with the Company $27,225.22, representing 200 depositors. The accounts averaged $136.13. On June 1st, 1920, the Pacolet Bank had 1,028 accounts, averaging $245.39. With a population of 1,974, comprising 360 families, the average is 2.9 depositors per family, or an average deposit per family of $702.68. A recent statement follows:

STATEMENT.

As of May 31st, 1920.

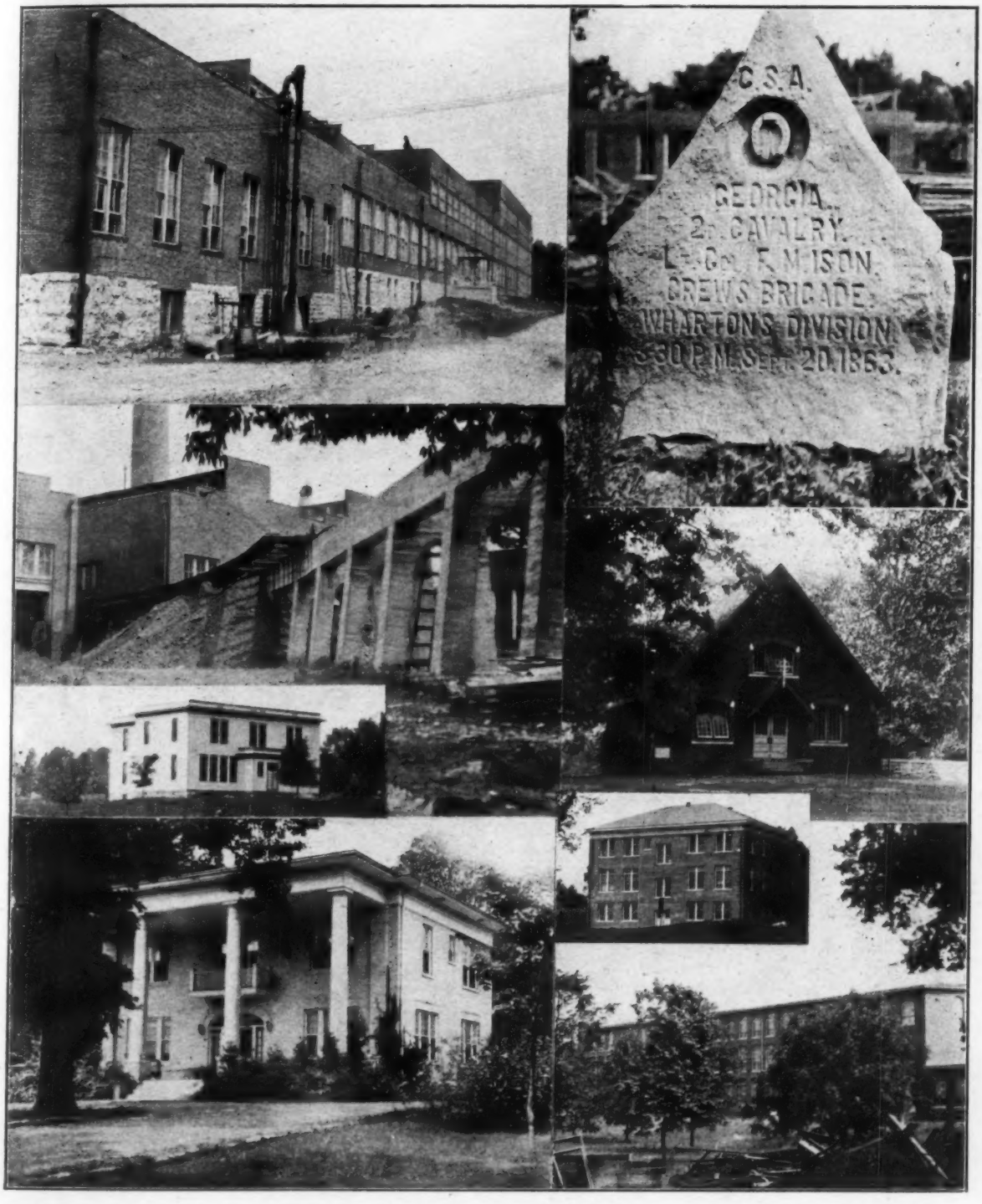
RESOURCES.

Loans and Investments	$180,178.90
Cash and due from banks	88,783.99
Total	$268,962.89

LIABILITIES.

Capital stock	$ 5,000.00
Surplus and profits	11,698.86
Deposits	252,264.03
Total	$268,962.89

Mr. Montgomery, in talking of the community service work, says it is important to get people interested in their work; that the best way to achieve this is to assist in creating such an environment that people will be happy and contented in their homes, take keen interest in civic improvement and take to principles of thrift. If there is a piece of "bucking timber," he says, it will be given a fair trial, but after time it must either fit into the structure or be thrown out. The spirit of civic pride is being so



LEFT TO RIGHT. TOP. CRYSTAL SPRINGS POWER HOUSE AND BLEACHERY BUILDINGS. CENTER. THE NEW COAL CHUTE AND THE VILLAGE CHURCH. INSETS. THE TWO SCHOOLHOUSES. BOTTOM. RESIDENCE OF D. A. JEWELL AND A GLIMPSE OF THE BAG MILL.

thoroughly imbedded in the hearts of the peopleof Pacolet Mill village, Mr. Montgomery believes, that the citizen body would not brook in their midst one who failed to take a deep interest in making the community a better place to live in.

Among this happy and contented people, unionism has no place. "We run closed shop," says Mr. Montgomery, but adds, "closed against unionism." He says if a man wants to join a union he has no objection to his doing so, but he must go to some other mill village and join it.

THE NEW COMMUNITY HOUSE, DAY NURSERY, HOSPITAL AND LIBRARY NOW UNDER CONSTRUCTION AT THE CRYSTAL SPRINGS BLEACHERY, CHICKAMAUGA, GA.

Saturday, July 31, was a red letter day at Chickamauga. On that day President D. A. Jewell of the Crystal Springs Bleachery Company entertained the stockholders of the company and the operatives at a well-prepared barbecue. Another feature of the occasion was the formal opening of the new building which is to accommodate the community house, day nursery, hospital and library. While this building was still in an uncompleted state, work upon it had advanced sufficiently to allow its floors to be used for dancing. During the barbecue, the guests were furnished music by a brass band from a neighboring town and when the dancing began several fiddlers appeared who produced music of the old-fashioned type for that purpose. Later in the day an interesting ball game was staged on the athletic field of the company.

The Crystal Springs Bleachery Company includes a bag mill and a finishing plant. The bag mill has 22,000 spindles and the finishing plant a capacity of 145,000

MR. JEWELL INSPECTING THE BARBECUE.

yards daily. These are operated by two up-to-date power plants equipped with eight boilers of the Babcock & Wilcox and Casey-Hedges type, a steam turbine, a reciprocating engine and a small engine driven lighting unit. The steam power plants not only furnish steam for the mechanical processes but also furnish steam for the prime movers which produce electric current for consumption throughout the mills. Both mills are electrically driven.

Excellent water for the bleaching and finishing processes is secured from two springs of 21,000,000 and 23,000,000 gallons capacity respectively. Below one of these springs is a well-kept bathing pool with bath houses for the use of the people.

Another unique feature about this plant is that it is located within the boundaries of the government reservation at Chickmauga and scattered about over the property are stone markers showing the relative positions of various bodies of troops during the historic Civil War battles in this section.

The Textile Mills Corporation, High Point, N. C., has been incorporated under a charter permitting it to engage in various phases of textile manufacturing. The authorized capital is $250,000 and the incorporators include J. H. Millis and R. O. Lindsay.

The Cash Mills, Gaffney, S. C., have made application for an increase in their capital stock from $400,000 to $500,000.

The Erlanger Cotton Mills, Lexington, N. C., are to build a new cloth room building, 50 x 100 feet, standard mill construction. The engineering work is being handled by J. E. Sirrine & Company, Greenville, S. C.

The Nancy Cotton Mills have been organized and have purchased a three-story, brick building, 120 x 45 feet, with 8,000 spindles, at Tuckertown, N. C. John C. Lawson is president.

The Sherman (Texas) Manufacturing Company plans to build a waste plant of 30 x 80 feet, two stories of reinforced concrete. J. E. Sirrine & Company are the engineers.

The Yadkin Finishing Co., Salisbury, N. C., are to extend their plant with a new 50 x 100 foot building of standard mill construction, for which J. E. Sirrine & Company are the engineers. They also are having changes and additions made to their equipment.

The San Antonio (Texas) Cotton Mills, recently organized with a capital of $500,000, will convert the plant of the Lone Star Brewing Company, at San Antonio, into a modern cotton mill.

The recently organized Love Cotton Mills, at Lincolnton, N. C., will erect a 7,000 spindle plant to manufacture fine combed yarns.

The Cherry Cotton Mills, Florence, Ala., have just completed the installation of $25,000 worth of features at its plant for the convenience of its operatives. The company is now considering beautifying its residential section with parkways, playgrounds, shade trees, etc.

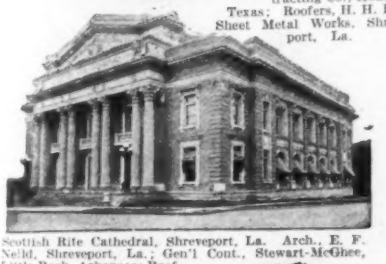
It is announced that the No. 1 Mill of the Hamilton Carhartt Mills, at Rock Hill, S. C., will erect a community house at a cost of from $15,000 to $18,000. There will be a reception hall, reading room, assembly hall with stage, billiard room and swimming pool, 40 x 80 feet.

Among the mills to recently engage the services of E. S. Draper, landscape architect of Charlotte, N. C., for

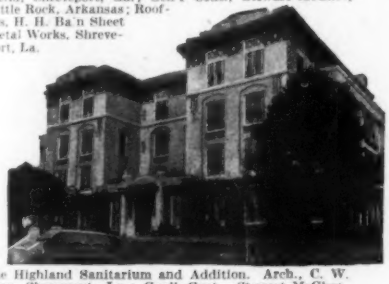
Barrett Specification Roofs

Bonded for 20 and 10 Years

City National Bank Building, Shreveport, La., Architects, Languinet & Staats, Fort Worth, Texas. Associate Architect, E. F. Neild, Shreveport, La.; Gen'l Cont., Central Contracting Co., Houston, Texas; Roofers, H. H. Bain Sheet Metal Works, Shreveport, La.



Scottish Rite Cathedral, Shreveport, La. Arch., E. F. Neild, Shreveport, La.; Gen'l Cont., Stewart-McGhee, Little Rock, Arkansas; Roofers, H. H. Bain Sheet Metal Works, Shreveport, La.



The Highland Sanitarium and Addition. Arch., C. W. King, Shreveport, La.; Gen'l Cont., Stewart-McGhee, Little Rock, Ark.; Roofers, H. H. Bain Sheet Metal Works, Shreveport, La.

Barrett Street School, Shreveport, La. Arch., Neild & Oishser, Shreveport, La.; Gen'l Cont., W. H. Werner, Shreveport, La.; Roofers, J. W. Wilkinson, Shreveport, La.

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AMERICA'S leading architects and construction engineers are practically unanimous in their endorsement of Barrett Specification Roofs. This is best proved by the fact that most of the permanent modern buildings all over the country have roofs of this type.

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And nearly all the important buildings erected in Shreveport in recent years are covered with Barrett Specification Roofs.

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Our only stipulations are that The Barrett Specification *revised April 15, 1920,* shall be strictly followed and that the roofing contractor shall be approved by us and his work subject to our inspection.

Important Notice

The Barrett Specification Type "AA" 20-Year Bonded Roof represents the most permanent roof covering it is possible to construct, and while we bond it for twenty years only, we can name many roofs of this type that have been in service over forty years and are still in good condition.

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the improvement and beautification of their villages, parks, mill grounds, etc., are the following: Arkray Mills, Gastonia, N. C.; Langdale and Lanett Cotton Mills, West Point, Ga.; Flint Manufacturing Co., Gastonia, N. C.

It is reported that the Brison Manufacturing Co., Gastonia, N. C., will double the capacity of its plant.

The Piedmont (S. C.) Manufacturing Company has made application for permission to increase its capital stock from $1,000,000 to $1,600,000.

The Florence Mills, Forest City, N. C., will, it is reported, install 100 new looms.

The United Mills Co., Hickory, N. C., recently chartered with $500,000 capital, has engaged R. C. Biberstein, Charlotte, N. C., to make plans for its new mill.

The Charlotte (N. C.) Spinning Mill Company will build a 100 x 300 foot addition, with power plant, at an estimated cost of $300,000.

The Norris Cotton Mills, Cateechee, S. C., are having planned by J. E. Sirrine & Company a new warehouse, 50 x 100 feet, three stories, standard mill construction; a Y. M. C. A. building of hollow tile and stucco with gymnasium, social rooms and club rooms, modernly equipped throughout. Also a six room school building, about 47 x 88 feet, two stories, of hollow tile and stucco, with slate roof.

It is reported from Calhoun, S. C., that L. L. Hester, president of the Little River Light & Power Company, is arranging to build a cotton mill and has purchased for that purpose 180 acres of land with water power estimated to develop 300 horse power.

The Moncure (N. C.) Manufacturing Company has been incorporated with a capital of $200,000 to manufacture cotton products. Among the incorporators are C. D. Orrell, Howard White and S. B. Shepherd.

The Roseland Cotton Mills Company, Lincolnton, N. C., recently organized, has ordered equipment to cost $85,000. A plant has been built consisting of a main building 160 x 82 feet, a picker house and power plant.

The Mobile Cotton Mills Company will, according to a report, make extensive improvements to their plant at Crichton, Ala.

The Woodlawn Manufacturing Co., Mt. Holly, N. C., has increased its capital from $125,000 to $400,000.

The Pickens (S. C.) Manufacturing Company has increased its capital stock from $250,000 to $750,000.

The Glenwood Cotton Mills, Easley, S. C., have made an increase in their capital stock from $600,000 to $1,200,000.

The Belton (S. C.) Cotton Mill has increased its capital from $1,400,000 to $2,800,000.

The Efird Manufacturing Company, Albermarle, N. C., has filed an amendment to its charter increasing its authorized capital stock to $3,000,000.

The Grace Cotton Mill, at Rutherfordton, N. C., is expected to begin operations at an early date. The new mill will make 36s fine combed yarns and will open with 6,000 spindles, this capacity to be doubled within a year. B. J. Dobbins is president of the organization. W. A. Harrill is secretary and treasurer and J. B. Moore, who has been superintendent of the Brison Mills, at Stubbs, N. C., will be superintendent.

The Santee Mills, Inc., Bamberg, S. C., are doing about $350,000 worth of construction work at their plant. In addition to extensive building they are also installing new and modern machinery in the mill. They have also added a number of attractive houses to the mill village.

Operations are expected to begin shortly in the new Eastside Cotton Mill at Shelby, N. C.; the machinery is now being erected. When completed the village of this mill will have from 45 to 50 houses, all fitted with water and lights, bath and range.

The Oakboro (N. C.) Cotton Mills have been incorporated with a capital stock of $500,000.

The W. S. Gray Cotton Mills Company, Woodruff, S. C., has increased its capital from $220,000 to $580,000.

A report from England, Arkansas, states that plans are being made for the erection at that place of a plant for the manufacture of cotton. Among the promoters is J. N. Castlio of the England Milling Co.

In response to a questionnaire sent out by the secretary of the Cotton Manufacturers' Association of Georgia, to which 85 per cent of the 2½ million spindles in Georgia responded, it was learned that 35 per cent of these spindles have already begun to reduce operating time and that 65 per cent will begin similar curtailment as soon as the orders now on the books are completed. The questionnaire also showed that the mills in Georgia were almost unanimous in their decision not to make goods for stock, but to discontinue operations rather than accept business on the present basis.

The New England Mill Situation.

Curtailment of production has become very extensive in the New England cotton manufacturing field due to the continued poor trade. The decline of business in the automobile industry has been felt extensively and several mills largely devoted to that business are either running short time or have given operatives unusually long vacations. Tire cloth and fine yarn mills have been especially hit but there are also many wide looms idle that were engaged on the production of special fabrics. Mills and agents have been requested in many instances to defer deliveries on contracts and several contracts have been cancelled. The condition is in marked contrast to the hectic demand of a few months ago.

Curtailment has also spread to many other mills. Many print cloth mills at Fall River are running four or five days a week, while others are giving operatives vacations or shutting down machinery as orders are filled. In New Bedford the curtailment is more extended both in yarn and cloth mills, the fine goods industry having been hit harder by poor trade than other lines. Gingham, cotton blanket, napped goods, and some other mills are running on old orders. A number of northern New England mills have given operatives vacations of two and three weeks at a time.

The printers of staple goods have been running on old orders. They have been getting little or no new business and have been catching up with many orders long delayed. Some printers are running four or five days a week while others have arranged to stop a week or two at a time. Finishers and bleachers are very dull. The printers of

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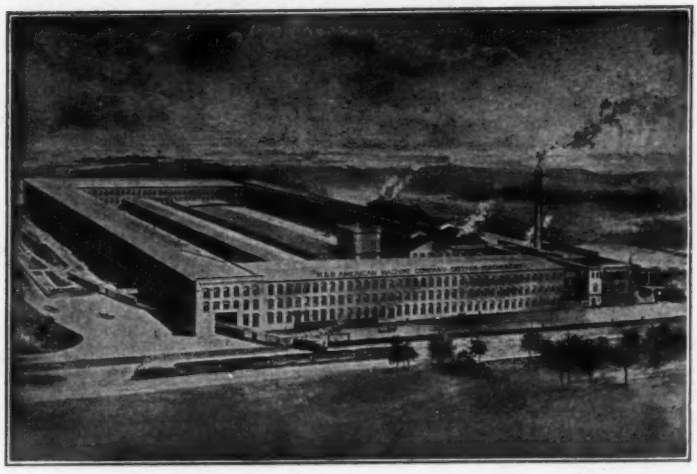

Spinning Room Machinery

Twisters for Wet or Dry Work

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H & B AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

fancy goods are rather better employed than other finishers but they are making very little headway in accumulating new business owing to the dullness among converters. Some of the bleachers are down to about 50 per cent and it is stated that some works are not operating to 40 per cent of capacity.

Transportation conditions are improving now that there is less to do. New and higher freight rates will go into effect this month and will have a far-reaching effect upon trade. The coal situation does not improve much and some mills to keep running have paid as high as $20 a ton for bituminous, and as high as $15 a ton for common pea coal. This element in the cost has become very serious with the finishers and others who use large quantities for steam and finishing purposes.

With so much idleness in silk and woolen mills, as well as cotton cloth and yarn mills, it is inevitable that some change in the attitude of workers is taking place. It has not yet reached a point where lower wages may be thought of and no change will be attempted before December at the earliest. Yet it is noted that demands have lessened greatly and workers who are employed are much better disposed toward keeping busy during working hours. There is much yet to be accomplished before manufacturers will be satisfied with the attitude of labor, nevertheless the change is clearly in the right direction.

The mills have just closed the most prosperous quarter in their history in the matter of dividends disbursed. Fall River mills paid an average of over 10 per cent for the third quarter of the year which was a phenomenal distribution for that center. It is now felt that the era of stock dividends and large cash dividends is over. The New England section did not catch the fever of wild advances in stocks and in stock dividends seen in England and the South, yet some of the chages in valuation were unsettling to the conservative spirit of bankers and manufacturers of long experience. Curiously enough, the popular trend of investment was not in the well known mill stocks so much as it was in the oil stocks, and get-rich-quick-schemes of the Ponzi type, operatives and others having been more attracted by the unknown than the known.

The views of manufacturers and merchants in this section concerning the future of trade have differed much from those in some other places and they are still quite opposed to the beliefs that are current in England and in some parts of the New York market. Generally speaking, experienced New England men have looked upon the reaction of the past few months as a deferred parallel with that seen after the Civil War, when the real reaction in cotton goods prices took place a year or two after the end of the conflict.

It is expected that there will be some revival from the low prices now current but such a thing as a quick return to very high prices is scouted. It is believed that the first stages of deflation have been so drastic that recovery cannot occur. Indeed, some bankers in the section who are watching the course of silk, wool, and cotton mills are very much inclined to think that unless the Federal Reserve pressure is removed during September, something akin to a merchandise panic can take place before the year is over.

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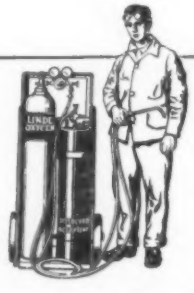

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The matter of reducing the costs of production is less clear in their minds than the deflation of prices, on goods for clothing purposes. In so far as the growth of the automobile industry stimulated the abnormal rise in prices, they believe that has ceased to be regarded as an influence that will repeat itself again in the near future. There will be a decided revival in the demand over that now seen, yet any return to the wild bidding and the frantic buying of the past year is not looked for, and so far as many mills are concerned, it will not be tolerated. The attitude of buyers for the automobile trade since they began to feel the pinch of declining trade has been so unmercantile in the matter of demands for cancellations and deferred deliveries, that some manufacturers have advised their agents to quietly mark certain firms off their books. They prefer to deal with jobbers or with the cutting trade who claim no special privileges in abrogating contracts, even when they exercise them.

The general course of manufacturers toward the markets has been one of conservation and cooperation. The decline in prices has been so very radical that it has been felt that few firms could meet all their obligations, hence unusual means have been taken to stabilize the decline where anything could be done. Instead of marking down the prices of ginghams and branded bleached muslins to the levels of value warranted by the shrinkage in gray cloth values, more moderate declines were named and prices were guaranteed to a definite period. In the case of bleached muslins agents were instructed to announce that no change would be made until October 15, at least, and in the case of ginghams, it was decided to begin diliveries in December and guarantee prices to that date or to the date of invoicing.

Even after the adoption of this unusual policy for the purpose of conserving jobbing values, and holding prices during the time in which jobbers would deliver fall goods to retailers, many of the jobbers did not place orders freely. Some of the largest jobbers have not placed orders for dress ginghams for spring. The mills have sufficient business to go on with but most of the new business came from the smaller factors.

The decline in print cloths called naturally for a very low price on prints and percales. Agents decided that nothing was to be gained in the way of new business by naming new prices in keeping with the 10 cent and 11 cent a yard decline in gray cloths so they stood pat and gave protection to customers up to October 1. By that time it is believed that conditions will have settled sufficiently to warrant some sort of price action that will clear the air. The converters of percales and prints have cut prices twice or three times in the interval yet they have not been able to sell goods on the lower basis. This has confirmed printers in the opinion that confidence and not price is the merchandising factor of immediate importance in mercantile channels.

Wide sheetings have held their value rather better than anything in the line except special qualities of duck. They are well sold for some weeks yet and buyers are taking the goods that are due. Some of the quilt mills have also found their customers willing to take goods as they were due when they would not take other fabrics willingly. The demand for satin quilts, damasks, and fine towellings, has been genuine and orders for them have held well.

There is considerable anxiety expressed concerning the probable attitude of buyers when they begin taking in large quantities of napped cottons and blankets. Thus far the jobbers have held by their contracts satisfactorily on the whole. Some cutters have found fault with wide fancy napped cottons but not sufficiently so to cause worry. It has also appeared that certain of the best known standard colored cottons in the heavier grades have been taken as fast as they became due. The really serious hold up has been in fine cottons, and silk and cottons.

The break in cotton prices in mid-August proved rather unwelcome, strange as it will appear to those who know the inherent desire of manufacturers for low priced staple. But the break came at a time when the jobbers were not out of the woods and it led to further hesitation and doubt concerning buying for fall and spring. Lower priced cotton was looked for after the July report was issued and the break in Egyptian followed by the decline in the automobile trade led manufacturers to look for more satisfactory prices on long staples.

Nevertheless, many manufacturers would have been quite as well pleased if the cotton break had been deferred for a month until the jobbers are fully assured that retailers will take in all the goods that are due them. At this time manufacturers in this section look for a revival in demand before the first of October but they are not counting on doing a large business if prices are restored to high levels.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, August 21st, 1920.

The downward trend of commodity values continues, owing to the depressing influences of larger crop prospects, increasing imports from Europe, absence of an urgent demand, and because of the stringency of money.

Returns to the government, as of date July 25th, pointed to a yield of 12,519,000 bales vs. 11,450,000 bales indicated on June 25th, linters not included.

Thus far the weather during August, while not altogether satisfactory in some sections of the belt, has been such as to permit further progress of the crop, especially west of the Mississippi, particularly in Texas and Oklahoma, where large crops are anticipated.

The world's consumption of American cotton last season was 12,735,000 bales including linters vs. 10,600,000 season before last, divided as follows:

Season	1919-20	1918-19
United States—North	2,660,000	2,500,000
United States—South	3,691 000	3,534,000
Europe and Asia	6,384,000	4,566,000
Total by world	12,735,000	10,600,000

The world's carry-over of American cotton into this season, or at close of last July, was 758,000 smaller than last year, 6,086,000 against 6,844,000, of which 4,383,000 was held in the United States compared with 5,291,000, in Europe, 1,703,000 against 1,553,000.

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The carry-over statement in detail follows:

Southern mill stocks	700,000	665,000
Counted interior towns	705,000	716,000
Uncounted towns and plantations	1,703,000	2,193,000
United States port stocks	756,000	1,213,000
Northern mill stocks	519,000	504,000
European mill stocks	410,000	305,000
European port stocks	1,293,000	1,248,000
Total carry-over	6,086,000	6,844,000

Of the total world's carry over, 5,086,000 bales were lint cotton vs. 6,094,000 last year, of linters 1,000,000 bales against 750,000, therefore the actual carry over of spinnable cotton was 1,008,000 less than last year.

Assuming that the world will consume as much this season as it consumed of American cotton last season, or 12,735,000 bales, and it will probably use more this season than last season, it is necessary for the growing crop to be at least 13,000,000 bales including linters vs. about 12,000,000 produced last year, otherwise the carry-over at the close of this season, or at end of next July, would be less than it was at close of last season.

At the moment prospects are for a larger crop than 13,000,000, pointing to about 14,000,000 including linters, but the crop is not made yet and has still to pass through all the vicissitudes to be experienced during the remaining growing and maturing periods, during which time tropical storms and an early general killing frost are possible.

Of late the interior has been complaining of too much rain over a major portion of the cotton region, causing weevils and worms to become more numerous and active, while shedding and boll rot is reported in many districts. Consequently the ultimate size of the crop, which will govern the course of market in the distant future, will depend upon climatic developments and doings of insects, which, in turn, will influence the course of values meanwhile.

So far as trade conditions in textiles are concerned we are disposed to take a favorable view of the situation in the long run, for while financial and trade reports are not satisfactory at present, these conditions are due mainly to present uncertainties, which we think will improve in time, as the masses in nearly all countries are well employed at the highest wages ever known, and the agricultural districts remain prosperous.

Meanwhile the market is depressed because of general unsatisfactory conditions, political and otherwise, but, as we said before, will likely improve with time.

The report of the New Orleans Cotton Exchange on the cotton crop of the United States for 1919-1920 has just been issued. This year's report is a very comprehensive one, containing complete and authentic information. It contains itemized reports of the different phases of the industry, including the supply and distribution, the consumption and mill takings, exports, the number of southern spindles and looms, etc. This information is given by states or by sections and is also given in a comparison of the figures of the year just past with those of former years. Copies may be secured upon request to Henry G. Hester, secretary, New Orleans Cotton Exchange.

In a booklet entitled "America's Opportunity" The Mechanics & Metals National Bank of the City of New York has renewed the campaign that was carried on early in the year by the Chamber of Commerce of the United States and the American Bankers Association for a proper financing of America's export trade. In this book, which it is now distributing, the Bank urges the immediate necessity, as well to our own prosperity as to that of Europe, for extensive long term credits out of which payments for American merchandise exports may be made.

"Since the armistice, nearly two years ago, efforts have been made abroad to devise means to reestablish normal industrial and trade conditions, but the task has proved a gigantic one, and at times disheartening. Some of the countries of Europe have made progress. Others have improved slowly, and today there is a persistent call upon the United States to render them help. The disaster which fell upon Europe could not pass away in a day. The people of Europe have turned to America for aid in helping them to help themselves. They are asking that America extend them credit so that they may buy goods and the raw materials to restore themselves to vigor and peace. They are asking that America maintain the great promise with which she entered the war."

In view of the present great scarcity of fuel and the unusual public interest in the economical consumption of it, the Uehling Instrument Company, 71 Broadway, New York City, has decided to exhibit their fuel saving devices at the Chemical Show, Grand Central Palace, New York, September 20-25, and the National Association of Stationary Engineers Convention, Milwaukee, Wis., September 13-17.

The principal products to be displayed will be the new "Style U" CO_2 recording equipment. This instrument keeps tabs continuously on by far the largest item of waste in the boiler room, namely the heat discharged up the chimney, thus enabling the operators to make adjustments that will reduce this loss to the minimum. A gauge on the front of each boiler serves as a working guide for the firemen and a recorder in the office of the engineer or superintendent simultaneously makes a permanent record of the performance of each boiler furnace. Other boiler room instruments, including Uehling pyrometers and draft gauges will also be exhibited.

The 1920 edition of the Official American Textile Directory, designed to be a complete directory of the textile and allied industries of the United States and Canada, is now off the presses and ready for distribution. This is the 26th year of publication for the "green book." It shows a total number of 9,145 textile mills in the United States and 433 in Canada, giving full information regarding each individual mill. The same convenient system of arrangement which has prevailed in previous editions is used this year, as is the use of textile maps which show only the cities and towns where there are textile establishments. There are 23 of these maps in this year's directory. This book, published by the Bragdon, Lord & Nagle Co., New York, is issued in two editions, the office edition, and the travelers' edition, with flexible covers.

Notes About Men You Know.

CHARLES B. PAULUS.

CHARLES B. PAULUS, with offices at 1516 Sixty-Eighth Avenue, Oak Lane, Philadelphia, Pa., and well known in the knitting trade as the selling agent for high grade latch needles transfer points, sinkers, jacks, etc., has just completed arrangements whereby he will also represent the Southern Chemical Laboratory in the distribution of their products. His pleasing personality, coupled with the quality products he represents, makes a combition entirely satisfactory to many knit goods manufacturers, hence his business success.

W. K. BALDWIN, until recently superintendent of the Klumac Cotton Mills, Salisbury, N. C., has accepted the assistant superintendency of the Locke Cotton Mills, Concord, N. C.

J. H. NICHOLS, overseer of spinning at Mill No. 5 of the Pacolet (S. C.) Manufacturing Co., has resigned to take charge of the spinning room at the Monarch Mills, Union, S. C. H. E. Chapman succeeds Mr. Nichols as spinning overseer at the Pacolet plant.

J. D. LOKEY, who recently resigned as overseer of carding at the Ware Shoals (S. C.) Manufacturing Co., has been succeeded in that position by Furman Clark.

C. B. HARRIS, formerly night overseer of weaving at the Erlanger Cotton Mills, Lexington, N. C., has become overseer of weaving at the Warioto Mills, Nashville, Tenn.

C. C. COBB, formerly superintendent of the Ella Mill at Shelby, N. C., is now general manager of the Montgomery (Ala.) Cotton Manufacturing Co.

S. A. BURTS has resigned as secretary of the Mills Manufacturing Co., Greenville, S. C., to become general manager of the Easley group of mills.

LEROY WERTS succeeds Mr. Burts as secretary of the Mills Manufacturing Co.

J. W. FERNANDER has been made overseer of carding and spinning at the Eatonton (Ga.) Cotton Mills.

F. G. ASBELL has resigned as overseer of carding at the plant of the L. H. Gilmer Company at Millen, Ga., and accepted the position of general overseer of carding at the Aiken Mills, Bath, S. C.

F. T. NEWBERRY, formerly superintendent of the Lauderdale (Miss.) Cotton Mills, has accepted the position of overseer of weaving at the Selma (Ala.) Manufacturing Co.

JAMES C. DOBSON, formerly connected with the Ashe Hosiery Mills, Knoxville, Tenn., as manager, has resigned to assume the management of the recently organized Texas Hosiery Mills, at Dallas, Texas, in the capacity of vice-president and general manager.

SAMUEL A. CARTER, president of the Gate City Cotton Mills of Atlanta, died Monday afternoon, August 2nd, at his home in Atlanta. His health had been failing for some time and about a year ago he relinquished the active management of his mill to his son-in-law, Lee M. Jordan. So great was his interest in the plant and its employees, however, that he continued to keep in close touch with the proposition until the end.

SAMUEL A. CARTER.

Mr. Carter was connected with the cotton firm of Carter & Bradley of Columbus, Ga., some thirty years ago. From 1897 to 1900 he was secretary of the J. K. Orr Shoe Co., and in 1900 he organized the Gate City Cotton Mills for the manufacture of hosiery yarns. As a mill man Mr. Carter had a successful career and was one of the organizers of the Cotton Manufacturers' Association of Georgia and an active participant in its work. He later became a member of the Georgia Manufacturers' Association.

Actively interested in promoting the development of Atlanta, Mr. Carter was for many years a director of the Chamber of Commerce. He was a devout Christian and an active member of the North Avenue Presbyterian Church. Genial, thoughtful of others and an active worker for any cause he chose to espouse, he leaves a host of associates among the manufacturers who will miss his cheerful greeting and his wise counsel at their meetings.

J. B. WRIGHT has resigned as superintendent of the Edenton (N. C.) Cotton Mills, and has accepted a position as superintendent of the Fieldale (Va.) Mills.

J. W. CATES, from Roanoke Rapids, N. C., is Mr. Wright's successor at the Edenton plant.

J. A. BAUGH, JR., agent, and B. W. Robinson, superintendent, of the La Grange (Ga.) Mills, and D. G. Reid, superintendent of the Hogansville (Ga.) Cotton Mills, have returned from the Pacific Mills—Lockwood, Greene & Company—Cotton Research Company conference held recently in Boston. They were unanimous in the report that they had a good time and that the weather was hot.

J. D. DOWLESS has resigned as superintendent of Rockfish Mill No. 4, Hope Mills, N. C., and will rest a while before taking another position.

HOMER ORVIS, of the firm of Orvis Brothers & Co., 60 Broadway, New York, has evidently found in the South something more attractive than cotton. It is rumored that her home is in Washington, Ga., and that the engagement will shortly be announced.

Time was when you liked to take a chance on a lucky packet, but you do not use that method in business.

Warren Soap and Warren Service combine the accumulated experience of a large part of the textile trade during fifty years with the most up-to-date scientific investigation.

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STRAIGHT LINE METHODS

The BUDGET

The Most Important Factor in the Control of Your Business

As the financial rudder to the Ship of State—so is The Budget of the executive in the direction and control of the finances of his business.

The present political campaign is directing general attention to The Budget as the only safeguard against extravagant and wasteful expenditures in government and the excessive burdensome taxes which are the natural result.

In the cotton business The Budget is of no less importance. At no time in the history of the cotton industry has a careful preparation and constant use of the Business Budget been so necessary as at present.

Cost in material, in labor, and in production, change over night. Prices drop, profits decline and loss seems inevitable. Even the fixed laws of supply and demand need intelligent application.

The only dependable safeguard against over expansion, over production, and over expenditure, is your Budget. It alone presents at all times the facts of your business, based on figures. It is the cause and effect of your financial policy. It is the ways and means by which your income and expenditure are conducted and balanced.

The successful executive in the cotton business today *plans his work and works his plan.* The Budget is his guide.
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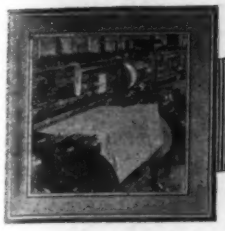
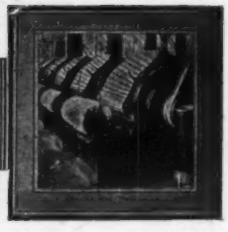
PROVIDENCE	ST. LOUIS	DETROIT	ATLANTA	HOUSTON
WASHINGTON	DENVER		RICHMOND	KANSAS CITY

STRAIGHT LINE METHODS



How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects



The Value of Belt Dressing.

EDITOR COTTON:

I wonder if the readers of this department ever consider the mistakes made in the operation of a mill. For instance, when we time the front rolls in the ring spinning room and find in most cases the speed varying from two to three turns, and in some mills greater variation, the front rolls receiving power from a belt on the main shaft making the largest number of revolutions.

What is the cause of this expensive loss of power, and what is the remedy? The cause of so much variation of front roll speed is the necessity of having a very large pulley on the shaft driving another pulley having a much smaller diameter on the frame. This, of course, reduces the working surface of the smaller pulley and the belt has very little chance of clinging to the small working surface offered by the smaller pulley, which is the cause of the slippage.

Many mill men are continually making the mistake of using a double belt instead of a single belt to drive the frame, in an effort to overcome this friction. This is a step in the wrong direction, because no benefit can be derived from a double belt as a heavy belt will not hug the small pulley as closely as will a single belt, owing to the resistance that the strength in the cross section of the double belt offers to its bend around the smaller pulley.

Again, it is very dangerous to run a double belt on a pulley designed to carry a single belt, because the weight and the rigidity of the double belt will sooner or later fracture the pulley causing, in most cases, disastrous results.

A variation in the speed on the front rolls will also make the doffing time vary, and if a system is not adopted to doff the frames on the line shaft first and work towards the window-alleys, some bobbins will not be properly filled, which is costly in the spooling room. It should be the aim of every foreman of spinning to fill the bobbins as much as possible, because when bobbins are not filled as they should be, the spooler box will contain much wood instead of yarn, which is also expensive.

This is nothing new to the readers of this department. However, when the opportunity presents itself, it would pay each one to time his rolls and see how much there is to what I am pointing out.

The only cheap remedy for all this trouble is a little belt dressing to make the belt cling to the small pulley. All shrewd manufacturers are aware of this fact and are never without belt dressing because they know full well that the small expense of belt dressing is doubly returned in production. Good belt dressing entirely eliminates initial tension required on belts not using belt dressing, thus saving the belt and relieving much weight from the bearings, which saves wear.

All carders agree that the uniform tension on a speeder depends upon a small piece of belting—the cone belt—and although some makers claim that they have a cone-driven speeder, the fact remains, to date, that on all speeders the bottom cone drives the bobbins. If the cone belts are examined it will be found that they all have a tendency to curl on the side; this is caused by the outlines of the cones necessary to obtain the intermediate speed. This plainly shows that there is a certain amount of friction on the cone belts, which is the cause of varying tension. If a little belt dressing is added every morning to the cone belts, an even tension will be obtained and in addition will eliminate much rack gear changing.

I have never visited a card room where I could not notice a few licker-in belts slipping. This causes a loss in production. It is very little trouble to add a little belt dressing to all card belts, as card belts will usually slip more than any other belt on account of so much fly which adheres to all belts. Some mills use castor oil; this will make the belts pliable but will not prevent friction.

Wash. (Conn.)

Making 12s to 20s Yarn.

EDITOR COTTON:

In selecting the most suitable grade and staple of cotton to use there should be two classes of cotton distinguished, viz., a grade and a staple. Of course all cotton is graded according to grade and staple but in making numbers between 12s and 20s yarn the grade is looked at more than the staple unless it is being bought for especially strong yarns or cloth. In this article we will consider the grade of cotton as more important than the length of the staple, as we will specialize on number 12s to 20s where cleanliness is of the most importance. These numbers will require a grade of cotton running about "middling" with from ¾ to 1 inch staple.

For a method of storing cotton so it can be handled to the best advantage, I would suggest the cotton be graded and tagged according to the grade of the cotton by the cotton grader as he receives it at the mill, sending it to the warehouse and storing it so that it could be easily taken out for the mill when needed. Bales should be stacked flat on one another with all tags facing the front alleys so that they can be seen by the cotton haulers who take them out for the mill. The cotton buyer having figured up his average grade he will leave this information with the cotton mixers furnishing them with the average number of grades which means the number of bales of each grade to go in at one mixing, for instance: if you were mixing ten bales of numbers 3-4-5 and 6 grades you would designate the mixture after this form, two bales of threes, three bales of fours, three bales of fives and two bales of sixes, which is No. 4.5 grade, or as near middling cotton as you

can practically arrange in a general way for an operative to be governed by and at the same time mix your cotton according to the grades you have in the warehouse.

In buying cotton, say in hundred bale lots, you grade all of this cotton up, find the average grade, then you figure out the number of different grades, average them up and get a standard, then you can scale out the mixings of any amount of bales you wish to and give them such number of bales of each grade as will constitute your standard of grades or your average grades.

About the best method of opening bales is to use a crow bar about 30 inches long, turned up at the end about two inches, run this under the end of the tie that is turned back near the buckle, pry the short end out and straighten out the short end of the tie; this will allow this short end to slip through the buckle and release the connection of the tie from the buckle, allowing it to be taken off. The bales of cotton being stood on the end you will take off all but two of the ties in this way leaving the ties on each end of the bales, you will then push the bales over on their edges, then release each tie on the ends, taking them off as you did the first, then cut the strings where the bagging is sewed together on the end of the bale, turn back the top pattern of bagging and pick all white cotton off the bagging as you slip the bagging off at the other end.

The old way of sampling seems to me to be the best, that is, by getting a sample on each side of the bale by cutting the bagging and getting a good sized sample about midway between the ends of the bales of cotton. If you have doubts as to the interior part of the bale, that can be sampled by using a steel spiked, gigged, tool about 18 or 20 inches long. Work this spike in where you have cut for the sample, forcing it to about the center of the bale, the gigs on the steel spiked rod (the rod being somewhat flattened) will get a good sized sample as you pull it out, aside from this method anything else is hardly practicable for finding inferior grades in the interior part of the bale. The outside of the bale can easily be determined by the sample drawn from the outside. The staple can only be determined by pulling small tufts in the regular form.

Having the number of bales that makes your average grade placed in the opening room at the bale breakers, feed a little from each bale alternately all the way down on all the bales so that they will run out together. The "vertical opener" is one of the best of openers, and, in my opinion, mixes the cotton better, loosening it up and getting it in small pieces making it easy to be carried up in the air flue by the suction system. In this vertical opener all heavy chunks and other heavy foreign matters are torn up or dropped to the bottom. The cotton going to the breakers is in a soft fluffy form and aside from being soft and of a tender nature should there be any dampness in it, it will almost dry itself out before it can be made into a breaker lap.

Under the head of mixing comes the various white cotton wastes from the carding and spinning, these should be mixed through a hopper by placing them in such a way that the hopper will deposit them in the pile of cotton that comes from the opener gauging the feed of the opener so that it will keep it steadily running all the time to take care of the waste. This will insure that all waste will be mixed gradually all of the time, instead of running heavy part of the time and light part of the time and none part of the time. Then, too, heavy waste feeding will cause split laps and split laps will cause uneven weights in the lap.

It is a mighty fine thing if using an automatic hopper feeding system which conveys the cotton from one hopper to another by means of a belt, to have this waste hopper deliver its waste onto the conveyor behind the first hopper that the feeder discharges cotton into. In this way it will be fed a little into each hopper all of the time.

The three blade opener beater making about a 16 ounce lap should be set about three-eighths of an inch from the feed rolls, which means that after getting the face of the beater blade perpendicular in this position, you will use this gauge straight down by the face of the beater blade. the extreme points of the feed rolls pressing against this gauge and the gauge being against the beater blade makes a sticky feeling as you pull the gauge up and down. As the feed rolls are usually 2½ inches in diameter, the three-eighths gauge will make about 1⅝ inches distance from the grip of the feed roll to the blow of the beater blade, so there is no danger of breaking the staple.

The two blade beater is usually on a breaker where three blade beaters are used as an opener beater. The feed rollers at this beater blade are also 2½ inches in diameter and this beater blade must be set in the same manner as the three blade beater was set, but by having gone through with one beating process the cotton will stand a little closer setting and it can safely be set to one-half inch in the clear like the three blade opener beater.

The two blade beater on the intermediate picker is set in the same manner in which the breaker beater and feed rolls were set, the cotton being softer, this blade is set a little bit closer and will bear setting up to a quarter of an inch between the beater blade and the feed rolls.

The finisher beater, which is a porcupine, (sometimes called a carding beater) is also set in the same manner as the other beater blades, using the gauge on the points of the spikes of the beater blade, and taking great care that you get the points at just the right place on the gauge when they are pressing against both top and bottom feed rolls. The gauging at this point can be set to one-eighth of an inch which is about as safe a distance as is practical to have them; of course they can run closer without damaging the cotton, if the teeth in the beater lags never get disturbed. However, different things will strain them and sometimes cause them to work a little loose, some will bend up or down and if set any closer might strike the feed roll. This will cause the cotton on the point of the spike to collect in chunks and later they will be released in wads making a thick place, and where there is a thick place there is a thin place before this happens because it is taken away from one place and put into another.

In considering the proper speeds for the beaters and fans we will first take the opener beater. This is usually a three-bladed beater and should run at about 900 r.p.m. The beater next to this on the front of the first lapper is a two-bladed beater, and should run at a speed of 1,400 r.p.m. The next on the intermediate lapper is a two-blade beater and the speed is governed by conditions greatly. It is most successfully run, when everything is in good

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Payment of higher interest rates will not always secure funds. In a situtation where larger amounts are required for handling individual transactions and restriction of loans may be necessary to provide for essential activities, "*side-tracked credits*" are doubly undesirable.

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condition, at a speed of 1000 r.p.m. The finisher picker has a spiked, or porcupine beater having three blades run at a speed of 950 r.p.m.

Fan speeds depend on what the fan has to do. Some fans have to draw the cotton through screens, while some only have to take the cotton to the screen at the feed rolls. When they have to draw the cotton through screens and trunks the speed will depend on the conditions, but ordinarily about 1500 r.p.m. When drawing only through a lesser channel, about 1000 r.p.m. will answer.

The fans on the intermediates need not run more than 840 r.p.m. In the finisher picker it will depend mostly on the draft created and the condition of the stock, and must be watched as to its splitting the laps, but a fairly good average speed is 1150 r.p.m.

The weight of laps for numbers from 12s to 20s should be no heavier than 12 oz. per yard. All laps should be weighed, and any varying more than a half pound from the standard should be set back and run over: for instance, if the standard lap is 40 lbs. and one should weigh 40¾ lbs., it should be set back. Half a pound from each side of the standard is quite sufficient to allow a lap weigher.

The adjustment of the evener is simple after a man gets acquainted with it; a simple turn of the evener screw represents so much on the weight, generally a quarter of a turn of the screw represents a quarter of a pound, and so on. The eveners should at all times be kept in good condition as nothing is necessary only to keep them clean and well oiled, only in case of long runs of the machines, when they should be taken down and cleaned thoroughly.

Some eveners have the Britton adjusters on them to save time in walking around the machine to where the evener screw is located. This is a device designed by W. J. Britton of the Spartan Mills. When once accustomed to using them it is difficult to do without them as they are marked or graduated so that so much of a turn on the screw means so much lighter or heavier a lap.

All experienced men know how important it is to keep the picker-room clean, especially from white cotton. Cleaning of the machines is also important. The white cotton on the floor is neither more nor less than carelessness and when once the operatives get in the habit of keeping it picked up as it is dropped it is no trouble at all. The pickers themselves should be wiped off twice each day. Some operatives have a rag "flap" to fan off the machines when they once get them rubbed off, which is a very good idea providing they take the precaution to keep the dirty matter from getting into the work. The floors should be swept up four times a day.

The cleaning of the beater boxes is of more importance than the average foreman thinks; they should be wiped twice each day, and the writer has found that to get them cleaned just before stopping time is the best; this is done with a piece of waste, although sometimes it's necessary to get scrapes and scrape them well before wiping them out. Then the men can wash up and at starting time they have nothing to do but to start up the machines.

Care must be taken in the transporting of the laps from the pickers to the cards as they are very easily torn up and a great loss made in waste, which means weaker yarn when it is run over.

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To secure better quality and greater production on the pickers calls for good even feeding of the hoppers with a good arrangement and an equal distribution of soft white waste, together with correct fan speeds, screens all clean and free from chokes around the ends, and especially on screens with draft regulators, have them set so as to get the best draft through the channel into which the cotton is drawn.

The proper way to set the draft regulators or dampers is for the top and bottom edges of the draft regulators to face and to be in line with the top and bottom of the channel or trunk. This forces the current directly in line with the channel the cotton is coming in, and with the trunk clean the cotton has a free passage and will be spread evenly on the screens. When delivered evenly to the feed rolls, the next draft flue will have less work to do than if the cotton is delivered in lumps or thin places. The screens on all pickers should be kept clean and if looked after twice a day it will be sufficient to insure their being kept in shape.

The feed rollers must be kept up with and all laps, which are usually caused by the gum which is found in the cotton, becoming stuck to the feed rollers, should be cleaned off. Little scars or rough places on the feed rolls will cause cotton to stick to them but not as often as this cotton wax. When waste or dirty matter gets lapped around the bottom feed rolls of the intermediates and the finishers it will cause the eveners to act inaccurately as the weight of the lap is governed by the flow of cotton passing between these rolls and this extra waste wrapped around the roller does not allow the proper amount of cotton to go through. As the evenness of the lap is strictly governed by the pressure of these two rollers, any little thick place in the flow of cotton on the aprons and passing through the feed rollers presses up the evener peddles which acts at the same time on the evener cone regulator therefore it will be seen that these rollers must be kept clean to insure an even spread of cotton. Having all of these points well guarded against, together with good cleaning and oiling, there is nothing to do but keep the machine running. And such machines kept running are bound to turn out good production.

On 12s to 20s yarn, using a twelve ounce lap, my card settings are as follows:

Feed plate to licker-in 10/1000 of an inch gauge.
Licker-in to cylinder 10/1000 of an inch gauge.
Flats at back stand 12/1000 of an inch gauge.
Flats at next two stands 10/1000 of an inch gauge.
Flats at front stand tight, 10/1000 of an inch gauge.
Back knife plate, 17/1000 at bottom.
Back knife plate, 12/1000 at top.

Stripping plate at front according to the amount of strips desired. On a general average this is about 4 per cent which will carry a full gauge, 34/1000, pulling the front plate down to a tight gauge.

Doffer to cylinder to a medium tight, 7/1000 inch gauge.

Doffer comb blade to doffer at point of teeth of doffer clothing and points of the comb blade, the closest pitch to which the comb blade teeth can be set for safe results in case the doffer band drops off and the cotton becomes lapped around the doffer is to set at a full gauge, that is 34/1000.

My reason for setting at the gauges named is that, all things being considered, with those gauges, together with the distance of the extreme grips of the cotton at the different places, there is no danger of breaking the staple as it exceeds the length of the staple which is 7/8 to 1 inch long. That is for the feed plate and licker-in. On the flats, with a twelve ounce lap, the setting given is close enough to imbed the cotton so as to get so firm a grip between the cylinder and flats that it will card out all impurities imbedding them in the flats for the flat comb blade to later take them out in card strips.

The cylinder screen at the front, next to the doffer, should be set about 3/16 to 1/4 inch from the cylinder. The next setting, at the bottom center of the screen, should be set at a full gauge 34/1000 of an inch. The next setting place is governed by the extreme top end of the back screen but usually takes about 17/1000 of an inch gauge while the top takes about 10/1000 of an inch gauge. The

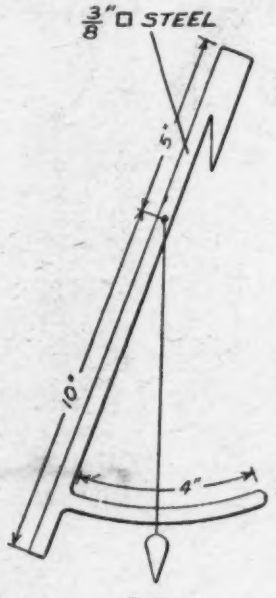


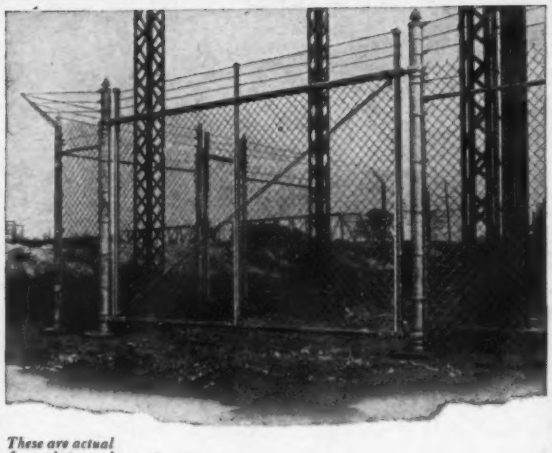
FIG. 1.

licker-in screen next to the cylinder screen will gauge about 10/1000 of an inch and the circle of the licker-in screen circles out to about 3/8 inch gauge at the extreme nose of the licker-in screen.

The mote knife settings are as follows: The back mote knife next to the feed roll should be set at about 15/1000 of an inch gauge, while the second mote knife blade should be set at 10/1000 of an inch gauge. The angle of these mote knives can only be determined by the condition of the licker-in teeth, as with a new licker-in where the teeth are good and sharp the mote knives should have less angle and be set more perpendicular as we have to guard against white flys, at the same time getting as much trash out of the cotton as possible, and to determine this we must set the mote knives so as to take out some white cotton and then we must give the mote knives less angle until we split the difference between white cotton and real card flys. Card flys that should be taken out have a dark, dusty color and are matted with heavy impurities from the cotton.

One of the best ways to make sure the correct angle is

PERMANENCE



These are actual fence photographs—not hand-drawn "exaggerations."

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being given to the mote knives is to use a mote knife plumb gauge as shown in Fig. 1. The plumb bob is hooked on the mote knife which is in its rack. After the angle has been determined, a mark can be made on the angle staff so that in setting the angles of the other card knives the worker will have a gauge to go by. While it will not always come out correctly, it will be so close to the right gauge that a little tilt one way or the other, according to which is desired, will produce the proper results. This gauge has been tried out by a good many carders and has been found to be very useful.

Heavier slivers can be run, but about a 50 grain sliver per yard, not to exceed 55 grains, I find to give the best results. This will show a draft of about 96 on the card and when possible it should not be run any heavier. Then the production for ten hours per day will run around 150 to 160 pounds.

For cylinder fillet on numbers between 12s and 20s I use number 100s wire. On doffer and flat fillets the usual method is to use about 10 points finer than is used on the cylinder fillets which would be 110s.

The care and upkeep of cards can all be summed up in the cleaning and oiling. The fast runners should be oiled twice per day, the slow runners, such as feed shafts, doffer bearings and feed roll stands, once a day. Flat pulleys once per week. Cards should be rubbed off once a day and wiped off twice a day.

In grinding the cards, which should be done every thirty days, have the cylinders and doffer clothing well cleaned out and when put to grinding give the card a good oiling, after having cleaned the card off well. When the grinding is done and the clothing is sharp, after the settings are all done, clean the card off again, start it up and let it run, give it a good oiling in every oil hole on the card, then get ready to put the cotton through. Watch out for supplies for the cards and don't use an old piece too long, especially the flats and cylinder fillets. Re-draw and re-stretch old fillets when it can successfully be done at about 75 per cent of the pounds pressure used on new fillet. When it will not stand this pressure it is best to discard it for new fillet.

The drawing frame is the next process and for numbers 12s to 20s yarns and with card slivers weighing 50 grains per yard, six of these strands are put up at the back of the drawing frame and run through to one head on the front with a draft of 5.45 which makes the sliver on the front of the drawing frame weigh 55 grains per yard. Where two processes of drawing are used, six strands are put up at the back of the second drawing frame, and with a draft of 5.75 this sliver will weigh 57 grains per yard. Both drawing frames are figured to have metallic top rolls.

The speed of the front rolls on either of the drawing frames should not exceed 300 r. p. m., and evener sliver could be made if this speed were reduced to 260 or 270 r. p. m. The cleaning of the steel rolls should be done daily; that is, wiping them off by hand with a piece of soft waste, making sure there are no laps around either the top or the bottom rolls as laps around either of these rolls will cause chopped slivers. The cleaning of the bottom steel rolls should be done at least every other week, using a soft metal brush to scour the flutes in the rolls so that all particles or lumps and gum may be removed from the bottom of the roll flutes, and then they should be wiped off good and dry with waste. The roll stands should be carefully watched and heavy grease kept on the necks of the rolls, thus assuring constant lubrication. This grease should be replaced before it gets dry because dry grease gives no lubrication, but rather acts similar to sand in the stands of the rollers and will soon cut away the glaze on the necks of the rolls, causing them to run hot.

Care should be taken to see that all sliver guides are kept in good shape, i. e., all broken guide fingers repaired or replaced as it is essential that all fingers should be good so that they can guide each strand of sliver, thus preventing slivers from looping or running in double which, if it did not break the end down on the front, would cause thick places in the sliver. Either is detrimental to good work. If an end breaks down the frame is stopped, and a loss of production and perhaps bad piecing is the result. On the other hand, thick places in the sliver mean coarser thread all the way through.

The tension on the drawing frames is just as essential and these machines should be watched and carefully geared to get the proper amount of tension. It is better to run them a little tight than to run them too slack for it has been tested out that this will give a stronger yarn than those ends which are allowed to run too slack, even if they do not run slack enough to "loop-in."

The clearers on the drawing frames should be picked four times a day, the clearer waste being kept separate from the regular sweepings and baled and sold separately. The drawing frames should be wiped off (not fanned off) four times a day. All fast runners on the drawing frames should be oiled twice a day. The cuffs on the end of the top rolls are to be oiled when they are taken out to be cleaned every other week.

The setting of the steel rolls on this weight of sliver should exceed in the distance from center to center of the rolls 1/8 to 3/16 inch longer than the staple, although it is sometimes customary to have the third and fourth rolls set a little wider than that.

The slubbing frame is the first to give the cotton its twist and to place it on bobbins and care should be taken to not have the frame speeded too high, the spindle speed should not exceed 700 r. p. m. The draft of the frame should range between 4.00 to 4.65, preferably 4.50 which, the 57 grain sliver being used, will give 152 grains per 12 yards on the slubber bobbins which makes a mighty fine draft. The twist per inch put in for the best results on this weight of roving is one turn per inch, with the tension on the frames set so that the ends will pull even. A slubber must be watched as it is making its downward stroke of the traverse so that it will have enough tension on the end to make it show signs of twisting and not run through like a ribbon tape, i. e., flat. Ends on the slubbers will always run slacker as the traverse goes down, especially close to the extreme top of the bobbin and when the traverse makes its change at the top of the bobbin, the ends will pull tighter as it gets toward the bottom. This difference must be equalized so that the ends will not be too slack at the top nor too tight at the bottom. This slackness at the top of the bobbin will show up greater in damp weather or when there is too much humidity in

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the room. This point will have to be watched on all roving frames and, if possible, the humidity in the room should never be more than 53 to 58 degrees.

In setting the cone belt on the cones the belt should be set about two inches from the end of the cone when starting up on a fresh doff, using as low a bobbin drive gear as possible, and then using the proper tension gear that will feed its way out holding the ends to a slight tension. All tensions must be set with the traverse going in a certain direction, preferably on the downward stroke of the traverse, care being taken that the frame should be doffed in this way thereafter. Then the same tension will be secured and the proper benefit derived from the settings.

The frame should be wiped off thoroughly, the carriage and head end casings wiped off twice a day, spindles picked once a day, the back of the frame cleaned out three times a week, leather top rolls cleaned twice a week, bottom steel rolls twice a year, carriage casings twice a year and the spindles oiled to suit the individual as there are so many different ideas about doing this work. Some say oiling spindles causes them to choke up and make tight spindles which cause the frame to pull hard which is true, but just how much oiling should be done is usually left with the individual foreman. However, the steps should be oiled at least every 30 days. The tops of the spindles should be kept clean, also the necks of the flyers so that the flyers will go down on the spindles correctly, either one getting choked will cause tangled bobbins.

The creeling of the slubber should be done very carefully to avoid thick and thin places and it is best to creel the slubber in full at one time rather than to let the cans run empty.

Roving frames take from the slubbers the bobbins which are usually two ply or doubled at the back of the frame and the spindle speed on this weight of roving should not exceed 1,000 revolutions per minute, using 172 grain slubber roving. The draft of this machine should range about 6.00 draft which, being doubled back, would give 50 grains per 12 yards of roving. The twist on this roving per inch should be about 1.80 turns per inch and the tensions on the frames set so that the ends will pull even.

To get the turns per inch in a given hank roving get the square root of the hank roving, multiply this by 1.20 which will give approximately the required twist per inch for coarse hank rovings up to 2.00 hank. But using cotton which will only average about 7/8-inch staple it will be necessary to add in extra twist to make the bobbin firm on the speeder and keep it from breaking back in the spinning. Roving should have a good round twist. It makes it draw better in the spinning and the yarn is more even than slack twist roving. Take as an example the 2.00 hank roving, the square root of which is 1.414 and from long experience 1.80 turns per inch on this class of work gives the best results in spinning and in this case it will give 1.27 times the square root of the hank roving. 1.20 times the square root of the hank roving is mostly given as a starter and the class of work and the numbers of the yarn are always to be considered and the necessary twist put in to make it run good in both carding and spinning.

Piecing of the ends on roving frames and the creeling has a good deal to do with the running of the stock in the spinning room. Bad piecing or hard twisted ends will break down in the spinning and also damage the top rollers. Ends should not be pieced hard twisted, they should be made with soft even strands. The creeling should be done with a short piecing at the back and the ends should not be doubled in. When they are doubled in it makes coarse work. Where ends are pinched together too fine it will make a thin place and we all know that yarn is no stronger than its weakest place.

The frames should be well oiled and cleaned and all loose bolts kept tightened up for when bolts become loose the machinery is going down for lack of attention. If one loose bolt is allowed to stay loose knowingly, it won't be long before there are two loose bolts and bad work will begin to appear. All belts should be kept reasonably tight. The cone belts on the roving frames should all be started within about two inches of the small end of the bottom cone, then put on the proper compound change gear and the proper tension wheel that will carry the cone belt out to the full doff of the roving frame giving a uniform tension throughout, and then do not allow the frames to run too full before doffing as this will cause the roving to be stretched from the pressure of the flyer and presser.

Contributor No. 14.

The Effect of Twist on Yarn Strength and Elasticity.

Bulletin Series 23 No. 4 of the Lowell Textile School carries the record of an important investigation which was made during the late winter and early spring of 1920 by Charles H. Forsaith of the class of 1920. The object of the experiment was to determine the relation between the amount of twist in a given strand of cotton and the length and elasicity of the strand.

The method of solution was as follows: a No. 13 single cotton yarn was spun from strict middling upland cotton of about seven-eighths inch staple, using three operations of picking, one of carding, two of drawing, three of roving, spinning the yarn from double roving.

The yarn was spun upon a tape-driven spinning frame, using twist multipliers from 2.75 to 6.75, inclusive, increasing by increments of .25. There were twenty bobbins of yarn spun with each twist multiplier. Both single-thread and skein tests were made upon the yarn, the skein tests being made upon a sixty-yard skein on account of the limitations of the testing machine. The single-thread tests were made upon a Schoepper single-thread testing machine. In making these tests it was recognized that the comparison made was between yarns of different twists, and because the tests covered a period of several days it was necessary to adopt a method of test which would insure, as nearly as possible, a like hygroscopic condition of each kind of twist.

Accordingly, the bobbins to be tested were arranged in a case in seventeen rows with twenty bobbins in a row, and the test was commenced by taking the first bobbin in each row, then the second, and so on through the entire set of three hundred forty bobbins. During all the time that the yarn was being tested, and for several days before, these bobbins were kept together in the same room, so that they all were subjected to the same atmospheric conditions.

As two single-thread tests were made from each bobbin this meant a series of thirty-four single-thread tests of each twist. It took, after a little practice, about twenty minutes to make the tests upon the seventeen bobbins in a series, so that it is not probable that there was any appreciable change in the hygroscopic condition of the yarn during that time. To further prevent errors that would arise from changes in moisture content of the yarn, complete sets of breaks were always made; that is, seventeen bobbins, one of each kind of twist, or a multiple of seventeen bobbins, were broken at each period of testing.

A similar method was adopted in making the skein tests, which consisted of two tests from each bobbin in the series.

The table shows the twist multiplier used, with the calculated and actual twists per inch found in the yarn. The actual twists were found by examination of six different bobbins in each set.

TWIST TABLE.

Twist Multiplier.	Calculated Twist.	Actual Twist.	Twist Multiplier.	Calculated Twist.	Actual Twist
6.75	25.2	27.3	4.50	16.4	15.3
6.50	24.2	25.7	4.25	15.1	14.5
6.25	23.3	23.7	4.00	14.4	14.1
6.00	22.4	23.2	3.75	13.8	13.6
5.75	21.6	21.2	3.50	12.9	12.0
5.50	20.2	20.2	3.25	11.9	12.0
5.25	19.6	19.6	3.00	10.8	10.8
5.00	18.4	18.1	2.75	10.2	9.6
4.75	17.3	17.8			

No attempt was made to correct the increasing contraction produced by the higher twists, as will be seen by an examination of the chart which shows that the hardest twisted yarn was about 11 per cent heavier than the softest twisted strand. This is shown graphically by the curve D at the bottom of the charted curves.

The curve C, representing the elasticity, was derived from the single-thread tests alone in the following manner. To insure like treatment for these yarns during testing, an initial weight of 57 grams was applied before clamping the strand in the lower jaw of the testing machine. This, of course, put the yarn under some strain, which would stretch it slightly, so that the curve obtained shows only the elasticity found after the application of the 57-gram weight, and does not indicate the entire elasticity in the yarn. It does show, however, that apparently the elasticity of this yarn varies directly with the twist.

Curve A, representing the relation of strength to twist as indicated by skein tests, clearly shows the rapid increase in strength that accompanies an increase in twist up to a point where the twist represents the use of a multiplier of about 4.25 or 4.50. The peak of the curve corresponds to a twist multiplier of 5.50, and from that point on there is a falling off of strength as twist increases.

Curve B at the top of the chart represents the relation of strength to twist as indicated by single-thread tests, and shows not only a rapid increase in strength as the twist increases, but after the peak is passed there is almost as rapid a falling off in strength that accompanies increases in the amount of twist. The peak of the curve appears to come at a point when the amount of twist in the yarn represents the use of a multiplier of 4.25 to 4.50. The difference beween the location of the peaks in curves B and A is a point worthy of extended investigation. Indeed, several points for further investigation are apparent from the results obtained from this test. These are now under consideration, and will be taken up in succeeding tests upon other cotton yarns.

[Note.—Accompanying the foregoing, and included as a part of the Bulletin, was the chart referred to in the text matter. Interested readers may secure a copy of this Bulletin and chart complete by addressing an inquiry to the Lowell Textile School, Lowell, Mass.—Editor.]

Card Room Hints.

EDITOR COTTON:

One common defect in a card room, which the writer claims is the basis of weak yarn, is to have a lap of cotton as it leaves the finisher picker contain tangled fibers caused by a dull beater, thus not allowing the impurities to escape. Beaters should be kept well sharpened (not to a knife edge) in order to open the cotton properly. A dull beater should be taken out and planed by one who knows how, and should be properly balanced before replacing.

Cotton that is not properly opened will disarrange the wire on the card cylinder with the result that the wire will be raised and come in contact with each working flat at every revolution of the cylinder, thus forming what is termed hooks on all high wires, which hold the fibers they act upon, and carry them around a second time or more, thus injuring and breaking them.

Another common defect is caused by the carder conceiving the idea that it is the quality of the cotton that determines the setting of the plate, when it is the length of the staple and the weight of the lap that should be considered. The thicker the sheet of lap the wider the setting. But a carder will receive more benefit from a light lap and the feed plate set at 12/1000 gauge, because a heavy lap with wide settings offers facilities for the production of a lumpy sliver, making it possible for the licker-in to pluck large tufts of cotton at this point. This is the reason why machine builders advocate getting the work from the card more rapidly, thus insuring a shorter draft on the card, and removing the strain on the points of the cylinder wire, caused by a long draft and bulky lap.

A light lap enables the licker-in to take the fibers sufficiently loose, and permits a constant attenuation at this point, while a heavy lap allows tufts of the cotton to escape, making the draft irregular and causing an uneven sliver with a flaky appearance. A light lap has many less fibers to be acted upon to the inch, thus the succession of licker teeth passing through the fringe of less fibers hanging downward causes much more of the impurities to be extracted, and makes a cleaner sliver at the front of the card. Williams. (Conn.)

The annual student's medal given by the National Association of Cotton Manufacturers was awarded this year to Bruce Crayton Baker, of Fairmont, N. C., a graduate of the North Carolina Textile School, West Raleigh, N. C. This textile school has just closed a very successful year. The attendance has been larger than in any previous year, 146 students having been registered, all taking the regular four-year course in cotton manufacturing.

Designs for Fancy Cotton Fabrics

BY T. WOODHOUSE AND J. IRELAND.

PART FORTY-NINE.

A check pattern, of a somewhat similar structure to the previous fabrics, is illustrated in Fig. 229. This example illustrates the formation of checks by means of change of weaves and size of yarns, for all the yarns are the same color, bleached white. Three different counts of yarns are used for the warp, and three different counts for the

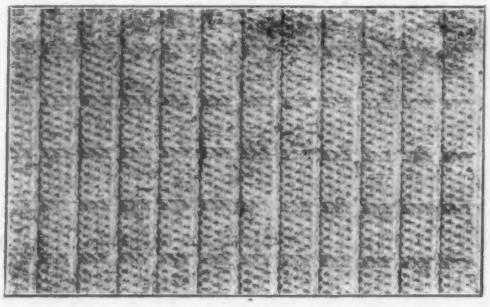

FIG. 229.

filling. The horizontal and vertical lines which form the checks are bold, and they contrast effectively with the dimpled effect of the enclosed rectangles. These boundary lines stand out so prominently that the threads and picks which constitute them appear as if they were laid on the top of the cloth instead of being woven in it.

The vertical stripes are developed by the thickest yarns of the three kinds, and the threads interweave with the filling in a broken twill order. A similar thick yarn is used as filling for the horizontal stripes, and these interweave with the warp in the same order, but in this case it is the filling that floats on the surface of the cloth.

The enclosed rectangular areas are developed by means of a pretty ground weave; two kinds of warp and two kinds of filling are used to show up the structure, for the weave is again of the pique type.

The warp threads for this cloth are again arranged, 2 threads of fine yarn for face and 1 thread of coarser yarn for back. There are also two counts of filling in the cloth, one filling to weave with—and of the same count as—the face threads, and the other filling, of a lower count, for the padding.

The full design for the cloth, on 36 threads and 75 picks, is shown at Y, Fig. 230. The various marks in the design represent the following yarn:

Crosses equal face threads lifted on face picks in the pique parts.

Dots equal back threads lifted on face picks in the pique parts.

Right diagonals equal face threads lifted when padding picks are inserted.

Left diagonals equal the threads of the vertical lines lifted to form the twill, and also where the face threads of the pique are lifted when the filling for the horizontal lines is inserted.

The design is so arranged at Y that the vertical stripe formed by the broken twill weave occupies the central vertical position, and the horizontal stripe, also formed by

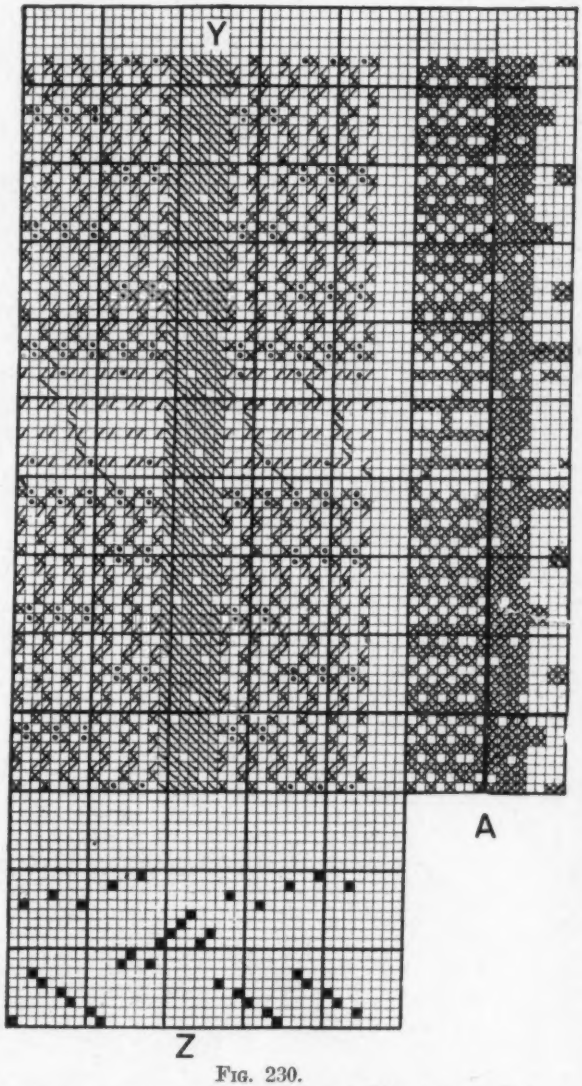

FIG. 230.

a broken twill weave, occupies the central horizontal position. The face threads of the pique part weave as usual with their own filling in 1 up 1 down plain order, but due to the disposition of the lifting of the back threads, the appearance on the face of the cloth is very elegant. The stitching points, the dots on the back threads, cause the fine face cloth to be drawn down, and results in that dimpled effect which is certainly one of the attractive features of the cloth.

The draft at Z is rather irregular, and occupies 16 harnesses. With this draft, and a dobby loom, the weaving plan would be that shown at A in the same figure. The cloth contains 162 threads per inch and 256 picks per inch.

We have shown a good variety of cloths in which pique weaves are used in some more or less important parts of the designs and cloths; in most of the cloths, however, the

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effects produced have been widely different, but in spite of the variety introduced, we have not by any means exhausted the effects which can be produced by this excellent structural weave.

The illustration in Fig. 231 shows a cloth of an entirely different structure. It is made from white warp and white filling yarns, and is of a very simple construction. The texture is close and well made; its effect is rich; and its wearing quality should be good. There are 112 threads per inch in the warp, and 120 picks per inch in the filling.

Four repeats of the design are given at B, Fig. 232, the unit being in solid marks. It will be readily seen that the weave is simply the 4 up 4 down twill to left, with the addition of an extra mark on threads 3, 4, 7 and 8. The difference between the effect produced by the ordinary 4 up 4 down twill weave and that obtained by the simple addition shown, is much greater than one would expect. The prominent and bold twill effect of the warp is maintained in the cloth, but there is also a pin-hole or cell-like effect running between successive warp twills, and this cell-like structure is due to the lifting of the above-mentioned four threads, each over one pick.

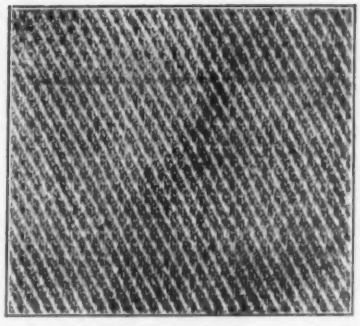


FIG. 231.

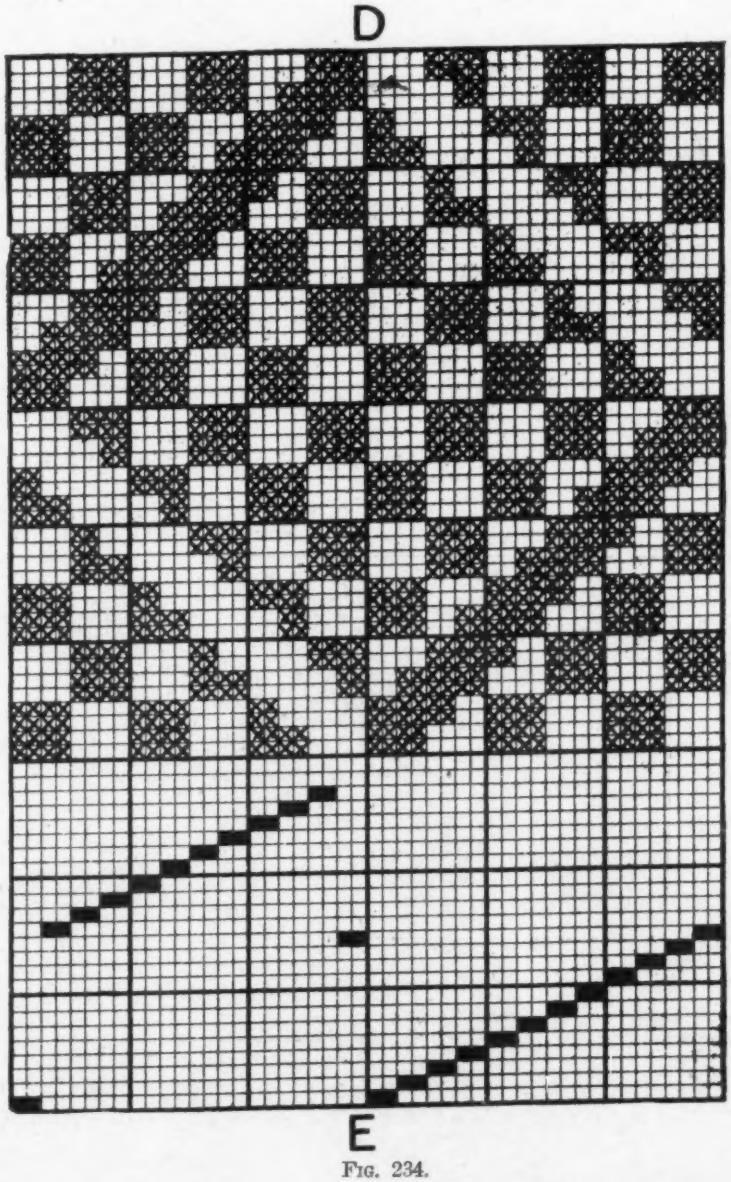
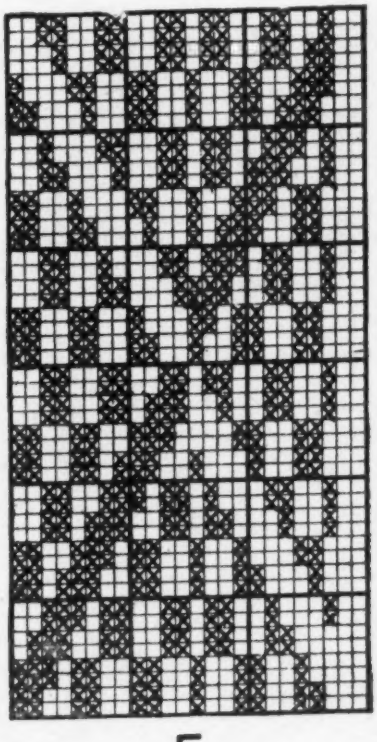


FIG. 234.



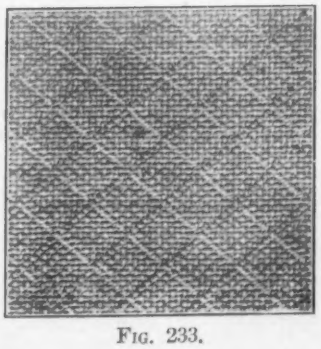


FIG. 233.

Gen'l. Manager--"so isn't there something we can do to cut out some of this roll covering expense?"

Superintendent:—"Well, it has often occurred to me that we re-cover a good percentage of rolls that ought in some way to be re-polished and used again, but I don't know how it can be done."

Gen'l Manager:—"I understand there is a recently patented machine, using electric or steam heat, and built like the usual evener rolls to save expert labor, and the manufacturers claim this machine will do this re-polishing and much more to improve drawing surfaces. When I visit the FOURTH TEXTILE EXPOSITION in October I will visit spaces No. 47 and 48 and see the machine in operation. In the meantime, suppose you dictate a letter to the manufacturers requesting them to send descriptive matter. It looks like that is just what we need."

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Factory at.....Birmingham

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Itself, because there are so few parts which enter into its construction, all of which are

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These parts are made in Jigs or Templates. These are checked up at regular intervals. This enables us to furnish perfect fitting parts at all times. This feature adds to the

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Saves Time
In the Spinning Room. No waiting for Quills to be cleaned.

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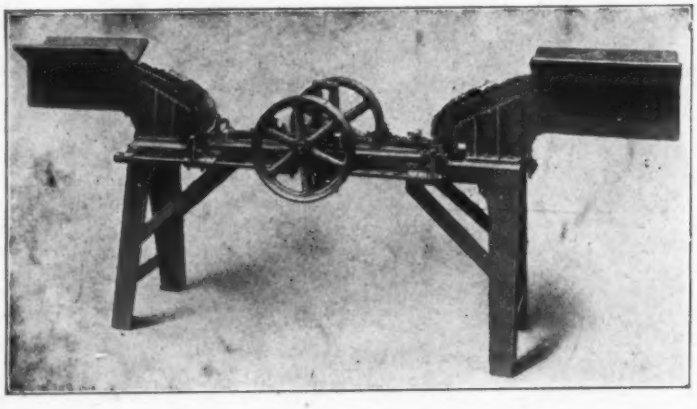

There is a Catalog containing full Information awaiting your request.

The TERRELL MACHINE CO., Inc.

CHARLOTTE **NORTH CAROLINA**

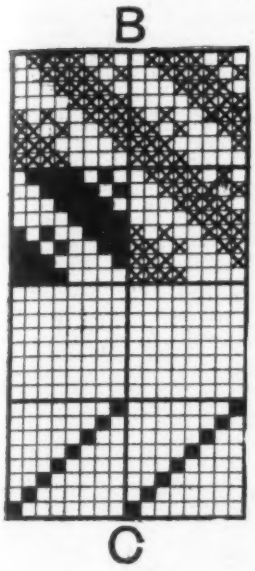

FIG. 232.

No two threads in the unit design weave the same, consequently the draft should be straight on 8 harnesses as at C, and the weaving plan would be identical with the unit weave. The same result in the cloth could also be obtained with the draft in the harness from back to front, provided that the weaving plan were also reversed.

An elegant and unique cloth is that from which Fig. 233 was made; it is a closely-woven fabric, the yarns of which are 2-ply twist warp and filling, and pure white. There are 136 threads per inch of warp, and 120 picks per inch of filling.

The design, one complete unit of which is shown at D. Fig. 234 on 48 threads and 48 picks, takes the form of a diamond with adjacent sides formed by warp and filling flushes. Thus, one pair of opposite sides is developed by floating double threads over six picks, while the opposite pair of sides is developed by floating double picks of filling over six threads.

The central or inside parts of the diamond figures are made by the 4 up 4 down basket or hopsack weave with the necessary slight modifications at those places which adjoin the two bands of filling flush and the corresponding bands of warp flush. Although this structure is easily recognized in the design, it is not so easily distinguished in the cloth; this is probably due to the compact nature of the structure.

A dobby with a comparatively wide range would be essential for the production of this cloth since it requires 22 harnesses as shown by the draft E. Two extra harnesses, or at least one extra harness, would be required for the selvages because the filling is in pairs; otherwise the second pick of each pair would partially withdraw the first. The weaving plan on 22 threads and 48 picks is shown at F.

The Mason Machine Works, Taunton, Mass., have just issued a new catalog describing the automatic looms which they are now placing on the market under the Randolph Crompton patents. It contains 12 pages of heavy plate paper printed in two colors and thoroughly illustrated.

"Contentment Under Roof" is the title of a new booklet just issued by J. E. Sirrine & Company, Greenville, S. C. It contains 16 well illustrated pages descriptive of mill village housing and similar community work. Town building in the South is becoming more and more a problem for the specialized man, the architect-engineer, who makes a complete and thorough survey of the situation and the conditions surrounding the particular industry, and then makes plans and recommendations that have the weight of knowledge and experience behind them. The booklet will be sent on request.

Joins Swan & Finch Staff.

Hundreds of mill men who are familiar with the optimistic smile of N. W. McGrew, formerly with the Crew-Levick Company, Philadelphia, will be interested to learn that this specialist in textile lubrication has joined the forces of the Swan & Finch Company, New York, as Textile Lubricating Engineer. Mr. McGrew comes to the Swan & Finch Company with an extensive knowledge of the requirements of textile mill lubrication, acquired through a long and through study of the subject. In adding Mr. McGrew to its staff the Swan & Finch Company makes another move in its big educational campaign to textile mills.

Several years ago, after a careful survey of the situation, this company reached the conclusion that the lubrication of textile machinery was far behind the times. In hundreds of mills visited, a surprising paradox was encountered, namely, modern machinery lubricated with old fashioned, obsolete oils of light consistency that caused

N. W. MCGREW.

heavy losses through dripping and spattering. According to the Swan & Finch Company the annual "stained goods" loss in the United States runs into the millions, practically all of this enormous waste being preventable. In the opinion of this concern the trouble is not so much that mill operatives are indifferent to this loss as that the men in the mill, too deeply engrossed with their own immediate problems of production to worry about lubrication troubles, have simply resigned themselves to the inevitable, taking it for granted that the "Stained Goods" loss and other evils of poor lubrication are a part of the game.

Already widely known in the textile field through Slo-Flo, a non-creeping, non-spattering lubricant, this company proposes to carry its work of education into every textile mill in the country by means of a highly specialized sales force under the direction of Mr. McGrew, backed up by publicity of a semi-technical character.

The Atlantic Dyestuff Company has just notified all of its employees who have been with the company thirty days, that they are covered, at the company's expense, with a substantial insurance policy,

The CHICAGO
Approved Portable
WATCHMAN'S CLOCK

Clock with case opened showing Dial in place and Partial Registration.

with its special Waltham movement, its lock stations and its superior quality throughout, is especially desirable for mills and factories and for either in-door or out-door patrol.

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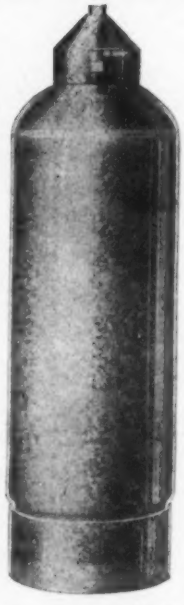

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PITTSBURGH, PENNA.

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New Plant of the Mitchell-Bissell Company.

Mitchell-Bissell Co., 251 Fourth Avenue, New York, are now manufacturing in their new factory at Trenton, N. J., a line of high grade porcelain guides for textile machinery which are fired several hundred degrees higher than ever before manufactured in this country. This porcelain is claimed to be the finest, hardest and the best porcelain made anywhere in the world. The material used to form the body of the porcelain is imported from various sections of the globe, only the very best being used. Previous to the past few months and after the European War it was necessary to use such material as could be obtained at that time, that, however, did not compare with the material now used in the factory.

Without question the new factory is the finest factory of its kind in existance, no detail being overlooked that would aid in securing the best results in manufacturing these goods.

In order to get the proper porcelain and the hard glaze it was necessary to secure the most expert chemists to work upon the forbula. And in making the small delicate guides for textile machinery the engineers had to design special presses. It also was necessary to design and install automatic drying machinery to dry the clay and saggers properly. In this work all dies are made of high grade tool steel, especially hardened and smoothly finished to make guides without flaws. It has taken this company four years to get just the proper dies for manufacturing these porcelain guides. Also, in order to fire this specially hard porcelain satisfactorily and withstand the intense heat developed they had to get experts in this work to design some special kilns that would give the exact results necessary with this class of work.

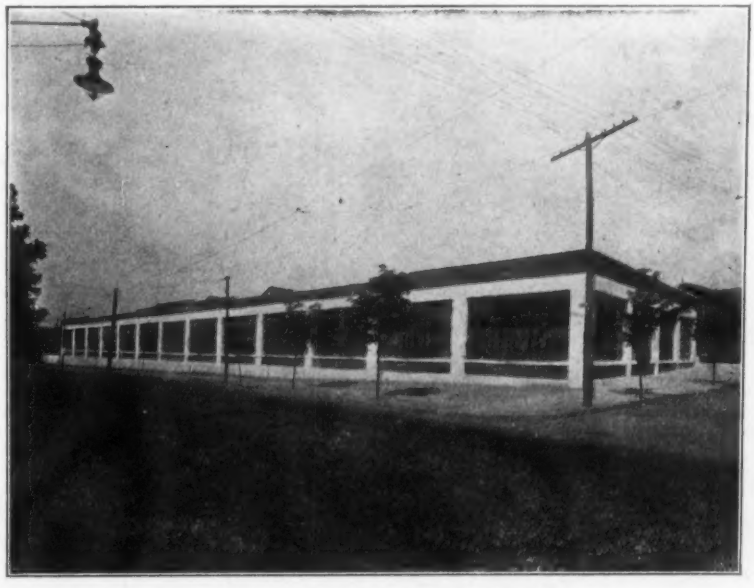
To finish porcelain guides after they come from the die they installed small motor-driven machines to take off any die marks or imperfections and make a perfectly smooth guide.

In firing the porcelain in the special kilns, which was found impossible by the use of coal, they installed oil burners using the highest grade fuel oil on the market in order to give the necessary intense heat.

The factory is also equipped with a vacuum cleaning system which takes up all the dust. This has always been a serious problem in the past in the manufacture of porcelain. All the Machinery for cleaning the porcelain is equipped with pipes which remove the dust. This makes the factory absolutely sanitary. Electric power is used throughout the plant.

In order to secure the proper organization the factory was located in Trenton, N. J.; the best labor for this kind of work being located there. It was necessary, however, for this particular kind of work to get only the best employees on the porcelain line and even with these it has taken months of training to enable them to accurately handle the many delicate and fragile pieces that are made.

The Mitchell-Bissell Company issues a complete catalog of the porcelain guides they manufacture which may be secured on request.



OUTSIDE VIEW OF FACTORY.

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A Boston Banker's View of the European Situation.

That the future is far from being as black as some reports would paint it; that the situation throughout Western Europe, at least, is distinctly encouraging, is the impression formed by John Bolinger, Vice-President of the National Shawmut Bank of Boston during his three months' study of the business and financial situation in Europe. While abroad Mr. Bolinger attended the International Congress of Chambers of Commerce at Paris, as one of the delegates from The American Bankers Association, and from the Chamber of Commerce of the United States. Mr. Bolinger received a general impression of the spirit of the people in each of the countries visited, which was distinctly reassuring as an evidence of the undiminished courage of the people and their apparent ability to see a way out of their present difficulties.

"Progress toward readjustment throughout Western Europe," he said, "is more general than some of us may believe." In discussing his impressions of Great Britain Mr. Bolinger said, "I was particularly struck by the interest manifested throughout Great Britain in the coming elections. They are not so much interested in the success of one or another candidate as they are anxious to see the signing of the Peace Treaty, which they regard as essential to any general undertaking leading toward improvement. There seems to be a strong current of unfavorable opinion as to the attitude assumed by President Wilson in making the signing of the Peace Treaty dependent upon the acceptance of his views with regard to the League of Nations, thereby delaying actual peace for a full year. That English merchants should be, to some extent, disturbed because of our progress in foreign commerce is but natural. The recently enacted Merchant Marine Law has given British merchants and shippers considerable concern. Far reaching and comprehensive plans have been formed, with the backing of the Government to meet the growing competition of the United States.

"Among the European countries involved in the war, Great Britain has been most successful, since the signing of the armistice, in carrying out plans for the restoration of her former position in international commerce. Commercial relations have been quite solidly established and active trade in considerable volume has already begun with the central powers, Germany, Poland, and Czecho Slovakia. Important advances have been made toward securing the future trade of the Scandinavian countries as an inlet into Russia. With regard to France and Italy, Great Britain continues to maintain the attitude of an Ally and to that extent is generous in her support of their efforts toward reconstruction and rehabilitation.

"The carrying out of this broad constructive program necessarily involves the extension of credit facilities in large amounts and on every occasion it has been found that the British banks are courageously facing their responsibility in the matter of extending credits.

"One very noticeable difference among British Banking institutions, as compared with our American banks, is the freedom from hampering restrictions generally enjoyed by the British banks. There can be little question that Great Britain's relatively strong financial position is largely due to the freedom of action enjoyed by her financial institutions. British banks are always in position to give adequate support to their international commerce in the full assurance that their efforts will be unhampered and that they can always count upon the solid backing of the Bank of England.

"It is quite remarkable how Belgium has come back to its pre-war position. The Belgians, unlike their French neighbors, went to work immediately after the Armistice rebuilding their wrecked homes and factories, and within a comparatively short time their industries were in full swing. Probably about 80% of the devastated Belgian villages have been rebuilt, the war has been forgotten; and the industrial population, and in fact every one in Belgium, is hard at work. Weather conditions since last winter have been very favorable and this good fortune is reflected in her agricultural activity. Every available bit of Belgian soil has been planted; and all of the crops for this year are very much better than any average crop of the pre-war period. The importance of this showing can be better appreciated from the statement that the Belgians will supply this year about 70% of their own food requirements. With regard to their foreign business the same activity is apparent. I have been advised that Belgian exports during the first four months of this year considerably exceed their imports. While such a record is distinctly encouraging it should be remembered that Belgium's heavy importations of raw materials and food stuffs were made during the latter part of the past year.

"Taking everything into consideration, France has made phenomenal progress in the rehabilitation of her industries and in the reorganization of her commerce. There appears, however, to be a rather general opinion that France's task would be further advanced but for her seeming reluctance to devote her entire energies to the work of reconstruction immediately following the Armistice. Almost a whole year was lost to her through delay in the negotiation of the Peace Treaty as a result of her elections. In some quarters there is a tendency to charge up a portion of the delay in the Peace Treaty as a matter for which we are to some extent responsible. Those who take that particular view express their disappointment that President Wilson, by his insistance on his definition of phrases in the League of Nations Covenant contributed to the postponement of final acceptance of the Treaty.

"France like Belgium is fortunate this year in having a very large, fine, crop of grain. It is expected that her crop returns will result in a saving to her of hundreds of millions of dollars for wheat and other food products, which, had her crops been poor, she would have been compelled to import from the United States.

"Some criticism has been directed by certain elements among the population toward the unsatisfactory financial condition in which the French Government has been placed. This situation is largely the result of dis-inclination on the part of the Government to adopt at once a policy of high taxation on the people of France. Cause for reproach on that score no longer exists, however. The new taxes, now levied upon every citizen of the Republic, give ample promises of a revenue more than sufficient to cover the ordinary expenses of her budget. Belief that Germany would pay large indemnities is in great measure responsible for France's reluctance to charge herself with amounts

which might properly be secured from Germany. The desire of the contesting political parties in the recent election to avoid the suggestion of huge tax burdens upon the community was also a factor in delaying the adoption of a practical plan of taxation. Nothing speaks more eloquently of the courage of the French people or gives greater promise of the ability of France to successfully overcome her financial obstacles than the uncomplaining acceptance of this tax burden.

"Speaking broadly the financial condition of France, Belgium and Great Britain may be regarded as distinctly favorable. It is true that there was a tendency toward high money rates in England during the early part of this year. Higher rates had also begun to prevail in Belgium during the Spring. In France there has been no marked activity in money rates and they are, in fact, but slightly higher than normal at the present time. It is readily possible nevertheless to foresee considerably higher rates for money this Fall, not only in Great Britain and Belgium but also in France. The possibility of higher rates of interest is not of itself to be regarded as suggesting any reason for alarm. They will be but a reflection of heavier demands for funds and in my opinion, may be considered as a healthy sign in so far as such increased demand for funds shows increasing industrial and trade activities.

"With regard to foreign exchange rates it is quite probable that we will find them seeking a much lower point than their present level before the end of the year.

"It is quite natural, of course, to anticipate that a certain decline in exchanges should result from our heavy exports of raw materials to these countries, particularly of cotton and grain, which will go forward in large volume during the remainder of the year.

"With regard to existing financial conditions in our own country, the continued tightness of money would seem to indicate that our transportation facilities are still considerably behind in the moving of merchandise. The recently granted rate increase holds out some hope for improvement in this particular, although, with the very best of success, there is little immediate benefit to be hoped for from that source. The large size of our crops this year, and the consequently increased demand for financing their movement, must prove added factors among the influences which will make for tighter money during the coming Fall.

"In giving consideration to the immediate future we should not lose sight of the fact that the securities market also must be supplied with funds. Securities are at the present time selling at such a low level that a loss of confidence in securities on the part of investors generally might seriously endanger the successful flotation of new issues."

On September 1, 1920, it is announced, the Flexible Steel Lacing Company will occupy its new factory at 4607-4631 Lexington St., Chicago, Ill. As heretofore, the entire facilities of this company will be devoted to the manufacture of Alligator steel belt lacing, high duty belt fasteners, turtle belt fasteners, Flexco lamp guards and Flexco-Lok lamp guards.

Notes About Men You Know.

H. J. STULZ, secretary of the United Chemical Products Corp., Jersey City, N. J., was a recent visitor in the South. He spent quite a while looking over the southern textile field gathering ideas and suggestions regarding the products of his company.

HENRY D. GAGNER, for two years superintendent of the Renfrew Mill No. 5, Adams, Mass., will soon begin the operation of a factory for the manufacture of novelty dress and shirt goods with silk warp and cotton filling. His position at the Renfrew Mill will be assumed by Benjamin Hetherington who has resigned at the Berkshire Cotton Company.

GEORGE M. WRIGHT has resigned as president and general manager of the Banna Manufacturing Co., of Goldville, S. C., and will in the future devote his entire time to the Watts Mills, of Laurens, S. C., of which he is president and general manager.

WILLIAM A. MOORHEAD, who has been with the Banna Manufacturing Company since 1907, has been elected to succeed Mr. Wright as president and general manager of that mill.

R. F. FERGUSON has resigned as assistant superintendent of the Ware Shoals Manufacturing Co., Ware Shoals, S. C.

S. L. MCCRACKIN, who has been spinning overseer at the plant for several years, will succeed Mr. Ferguson as assistant superintendent.

JESSE JEWELL, formerly at Fountain Inn, S. C., will assume the position of overseer of spinning made vacant by Mr. McCrackin's appointment as assistant superintendent.

JOHN W. GRAVES, a graduate of the textile department of the Georgia School of Technology, Atlanta, who has been associated with the Callaway group of mills in Georgia, has joined the selling force of the Saco-Lowell Shops and will make his headquarters with Walter W. Gayle, Greenville, S. C.

W. B. MORGAN has been promoted from overseer of weaving to superintendent of the Ossipee Division of the Consolidated Textile Corporation at Burlington, N. C.

ROBERT MCCOMMON has succeeded Mr. Morgan as weaving overseer.

The du Pont Fibersilk Company, recently incorporated for the manufacture of artificial silk, has bought a plant site of 100 acres with a frontage on the Niagara River on the outskirts of Buffalo, New York. When the work of construction is completed the company will have a factory area in its buildings of 200,000 square feet. It is expected that operation will be begun sometime next spring. About 700 persons will be employed at the works.

The du Pont Fibersilk Company was formed as a result of an agreement between the E. I. du Pont de Nemours & Company and the Comptoir des Textiles Artificiels, of Paris, France, which controls practically all of the largest artificial silk plants of Europe.

The factory will be built on the most modern and efficient lines and a product of the finest quality will be produced. The offices will remain for the time being in the du Pont Building, Wilmington, Delaware.

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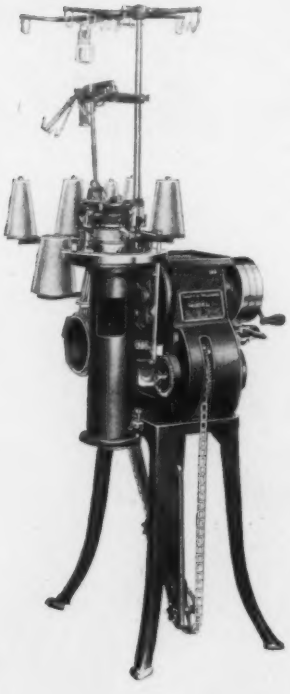
The Aim of All Manufacturers



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The Flatlock machine is helping to solve these problems for hundreds of underwear manufacturers. Two Flatlock machines will do the work of three of the old-fashioned two-operation type. They are easier to operate, occupy less floor space and require fewer operators. This means larger production at a lower working cost.

These are good reasons why your factory should be equipped with the

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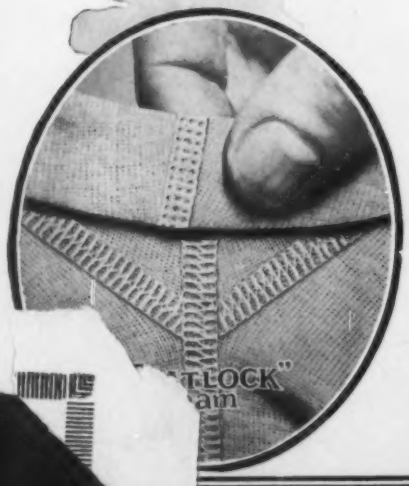

And another important consideration is the fact that the Flatlock machine makes a seam that is unequalled by any other. The Flatlock seam makes your garments more salable, for it is as smooth as silk—stronger, but no thicker than the fabric itself—a seam that always lies flat without pucker, ridge, or welt.

Our demonstration offer is open to manufacturers not yet using the Flatlock Machine. Information on this will be sent on request.

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Multiple Feed Stop Motions

BY G. R. MERRILL.

The use of a stop motion on multiple feed ribbers is of particular advantage. Because there are several packages of yarn to run out as well as have "imperfections" in them, there is a greater chance to have trouble. Then, too, the time required to start the large ribbers after the cloth has run off the needles, is so much greater than that required for small ones, that a protective device is particularly desirable.

The principle of this multiple feed stop motion is the same as that used for small ribbers, but the mechanical arrangement necessary to take care of many ends must, of course, be different. The device is arranged to stop the machine when an end runs out, when the yarn contains a large knot or bunch, when the tension on the yarn is too great, and when the yarn bunches up on the needle. A finger motion, somewhat similar to that used on small ribbers is used to stop the machine when the end runs out; bunches and knots catch on a hole through which the yarn passes and cause tension, and that tension or any other, is used to drop the yarn out of the fingers and so stop the machine. A bunch of yarn on the needles is taken care of by a needle running close to the fabric, similar to the device on small ribbers.

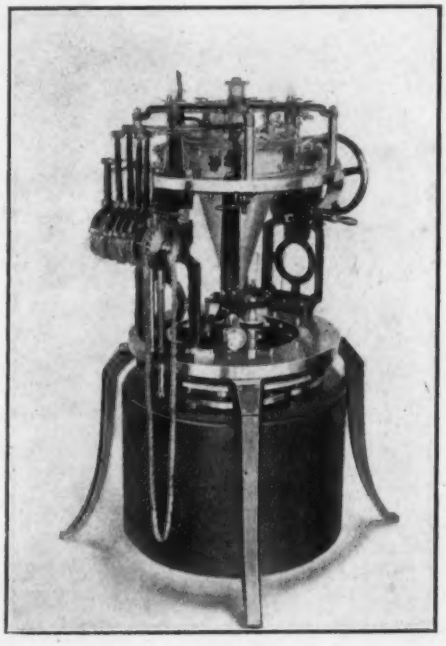
On this type of machine, the yarn cones or packages are stationary and the cylinder and dial revolve. The yarn packages are located in a circle about the diameter of the dial, from six inches to one foot above it. The yarn is led off from the packages upward about three feet and is then led horizontally so as to be about over the center of the machine and then down and out to the yarn feeds around the cylinder.

The yarn passes through a hole in a metallic plate as it moves upward, then over a movable finger and from thence, horizontally over another movable guide. From this point, the yarn runs downward but as it does so, it passes between a set of movable fingers and a sort of grid, and then finally to the yarn guide and the needles.

A view of the lower portion of one of these units is shown in the accompanying cut. In the center is the bunch stop motion and the connection with the head. The catch which holds the belt on the tight pulley is seen under the right hand side of the cylinder.

The plate containing the holes is shown in Plate 1. The holes, of which there are five, vary from one to five sixteenths of an inch in diameter and serve to detect knots and bunches in the yarn. The hole through which the yarn passes must be determined by the size, twist, smoothness and softness of the yarn. It must be large enough to allow the yarn to run through freely and to allow small knots to pass through it, but still must catch and hold large knots or bunches in or on the passing yarn. When these knots or bunches are caught at this point, they immediately cause a tension on the yarn which stops the machine.

The second device with which the yarn comes in contact is a guide, equipped with a movable finger, which is shown on Plate 1. This particular shape is used to allow the yarn to drop out of the finger and grid combination and still be held in the upper frame work of the device. This movable finger is held in position by a horizontal rod controlled by a spring in the head of the stop motion. Just outside the head, this rod has fastened to it a hook, at which the yarn turns a right angle and passes downward through the finger and grid. The spring, located in the head, is so adjusted that, when the yarn is under normal tension, it holds the movable finger in the position shown. When, however, the tension becomes greater than normal, the finger is drawn in towards the head. When this occurs, the rod is turned and the hook, near the head, is drawn



STATIONARY HEAD, MULTIPLE FEED STOP MOTION.

back so that the yarn drops off. Since this hook supports the yarn just above the finger and grid, when it drops the yarn there is nothing to guide it between the finger and grid and it drops out. This allows the fingers to drop and so stops the machine.

We can see that the tension necessary to cause the machine to stop must be great enough to draw the movable finger inwards against the tension of the spring in the head. To allow for the different tensions caused by different yarns, the spring may be allowed to contract until there is very little opposition to the movement of the finger, or the spring may be put under enough tension so that a very appreciable amount of tension is required to move it. The amount to which this spring is expanded is governed by a screw in the head which regulates the position of the spider to which they are attached.

It is apparent that so far, each action carries us to the movable fingers. The relative position of the movable hook and the fingers and grid is shown in Plate 2. Also, Plate 2 shows a plan view of the interior of the lower section of the stop motion head and one finger and grid connection.

In this diagram, a circular disc which covers the

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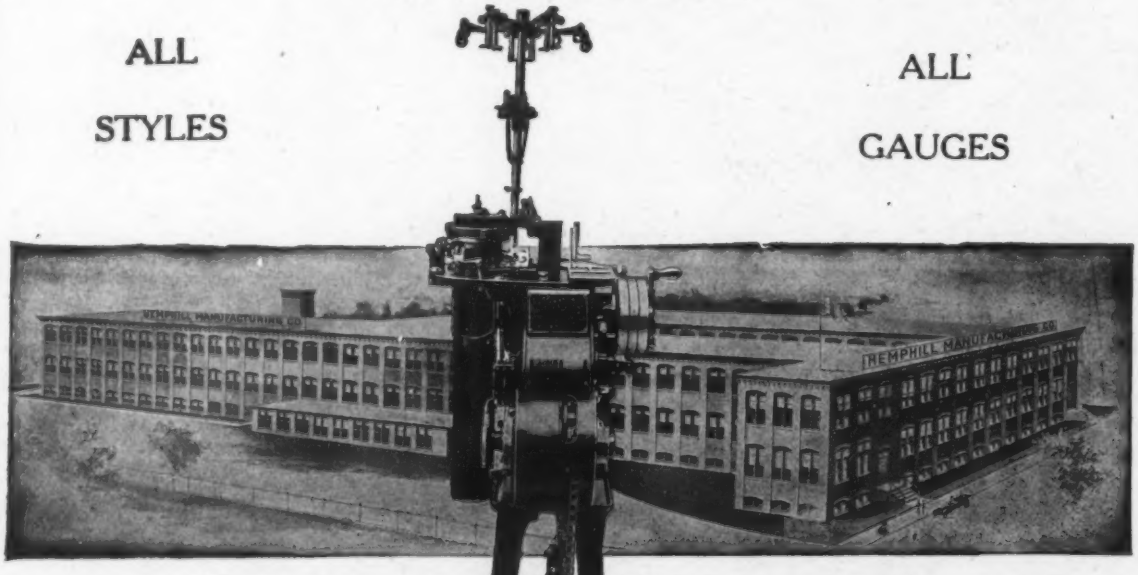
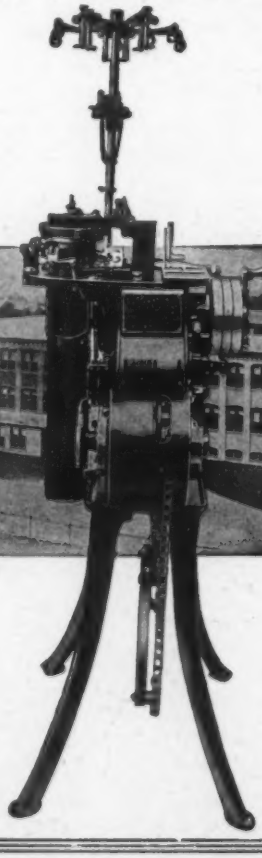
ALL STYLES

ALL GAUGES





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Pawtucket, Rhode Island.

Southern Office and Show Rooms
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Philadelphia Office and Showrooms, Rooms 205, 209, 210, Colonial Trust Company Bldg., 13th and Market Sts., Philadelphia, Pa.

Stationary Head.
Tension Releasing
Device.

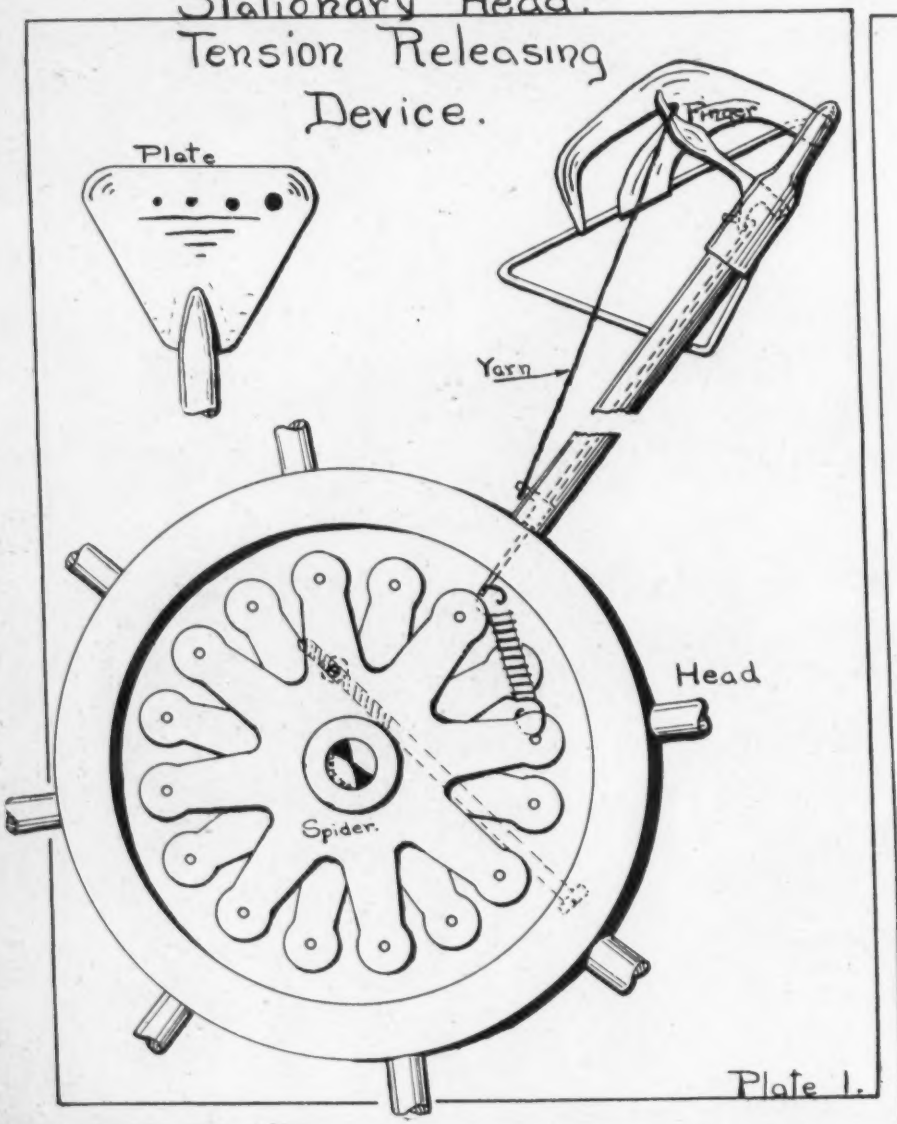


Plate 1.

Stationary Head.

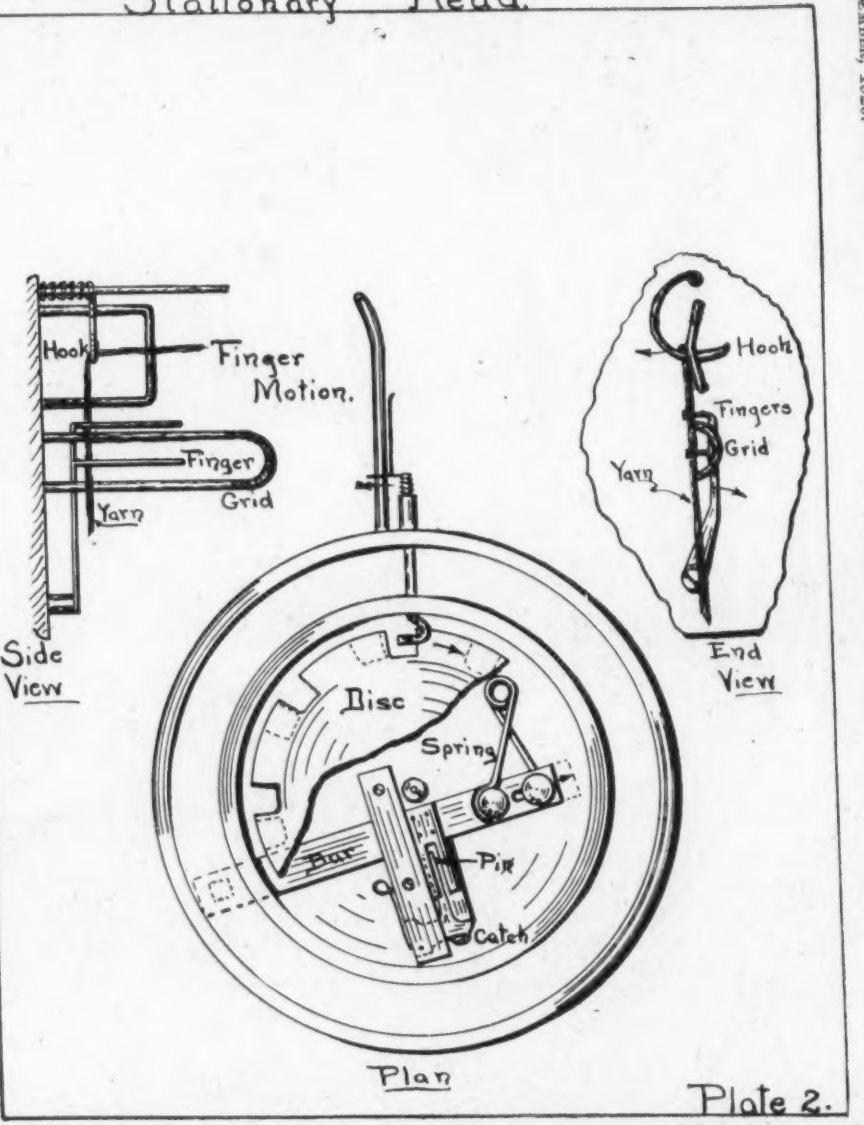
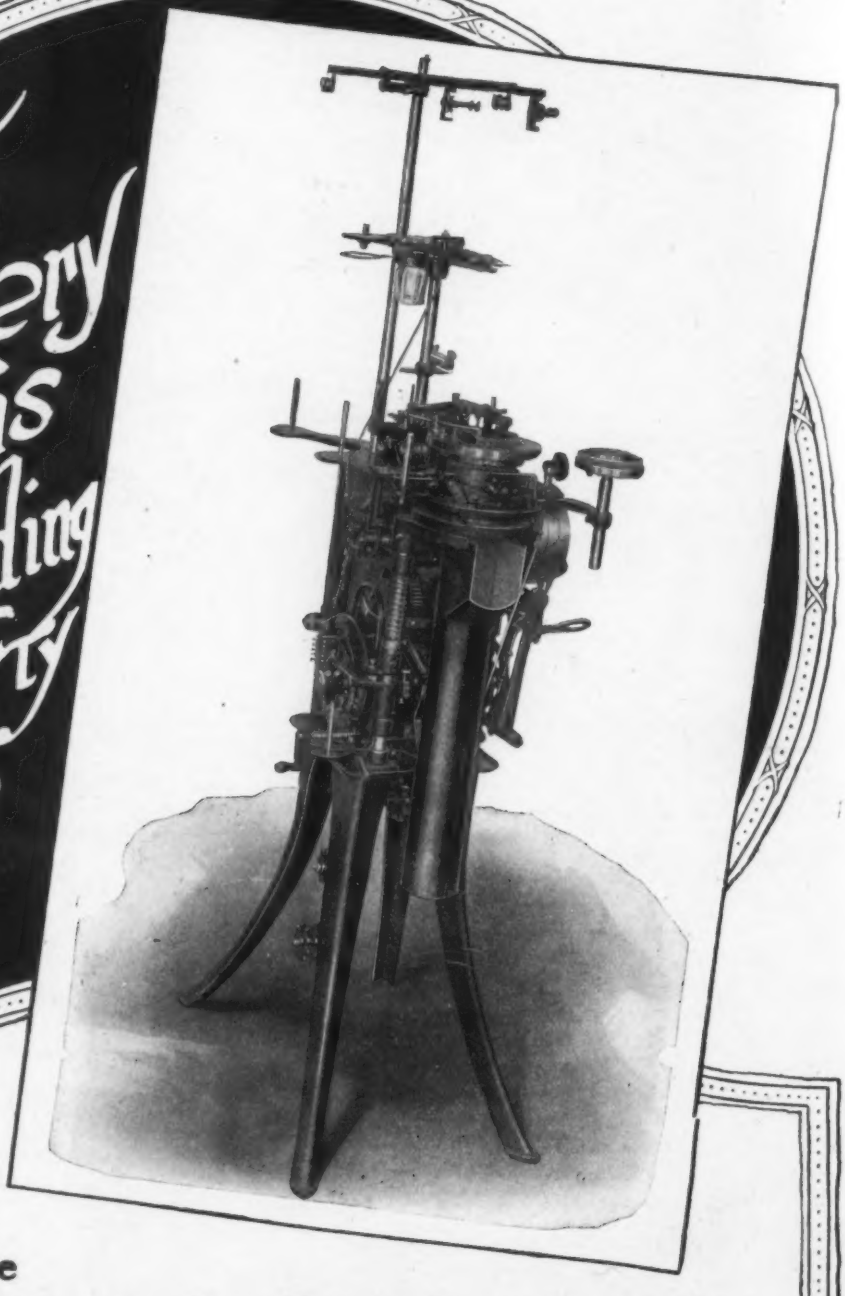


Plate 2.

The Hosiery Buyer is Demanding QUALITY



This Superior Machine Produces the Highest Quality Fabric Free From Lines

The hosiery buyers of today are demanding the highest quality they can buy,—if you can't supply them, they'll buy somewhere else.

There are different makes of knitting machines on the market, producing good fabric, but everyone knows the advantages of the spring needle machine for knitting hosiery, especially when using silk, and everyone knows that to make the finest and smoothest fabric free from any trace of imperfections it takes a WILDMAN Spring Needle Knitter.

The product of this machine finds a ready sale and a better price for the goods.

Get into this exclusive market—supply the demand for quality goods—by installing the WILDMAN Machine.

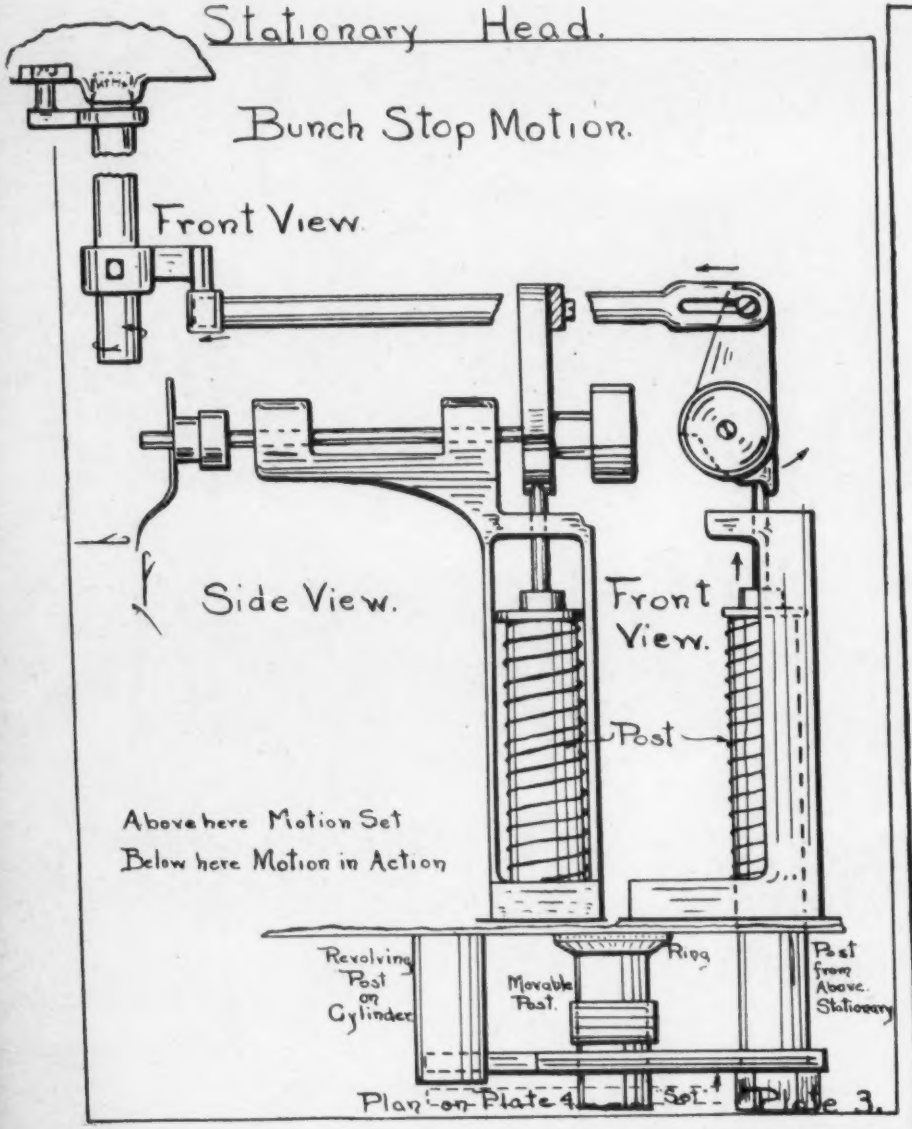
Write today for details.

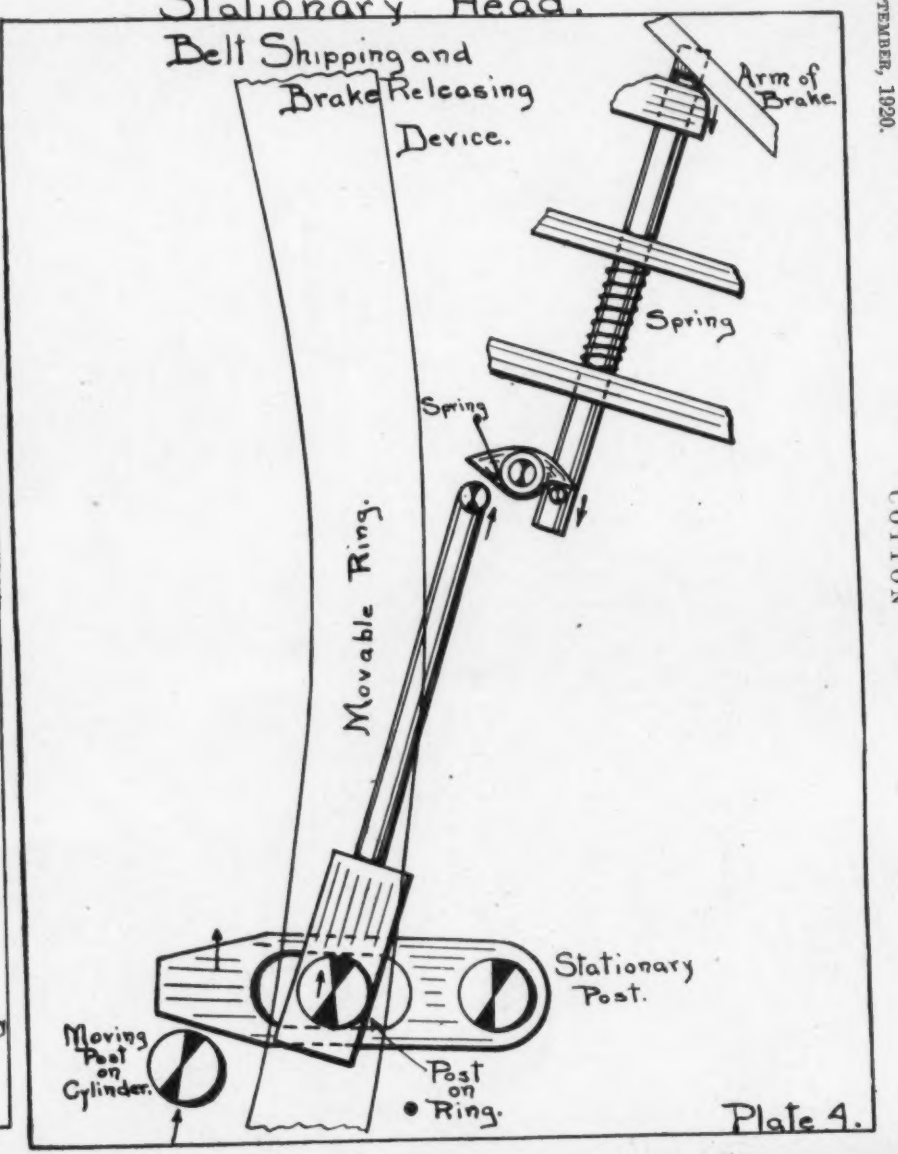
MFG. TRADE MARK

WILDMAN

SPRING NEEDLE KNITTER

MFG. TRADE MARK


Stationary Head.
Bunch Stop Motion.
Front View.
Side View.
Front View.
Post
Above here Motion Set
Below here Motion in Action
Revolving Post on Cylinder
Movable Post.
Ring
Post from Above. Stationary
Plan on Plate 4
Plate 3.


Stationary Head.
Belt Shipping and Brake Releasing Device.
Arm of Brake.
Spring
Spring
Movable Ring.
Stationary Post.
Moving Post on Cylinder.
Post on Ring.
Plate 4.

"works" is cut away, to show the spring which is under tension when the stop motion is set, the bar which it moves and the catch and releasing device. The mechanism is shown as it is when set. When the finger drops, the hook on its inner end turns in such a way as to cause the disc to turn in a clockwise direction. Fastened to the underside of the disc and projecting down from it, is a small pin which runs in a slot connected to the bar under tension. This pin is in contact with one end of the catch (when the motion is set) and is so placed that, when the disc is turned in a clockwise direction, it presses against the catch with sufficient force move it, and releases the bar acted upon by the spring and causes the machine to stop.

The finger is allowed to drop only under one condition, that is, when there is no yarn to hold it up. This condition may be caused by reaching the end of the yarn in some package or by building up a tension on the yarn great enough to draw back the hook just above the finger motion, thus allowing the yarn to fall out.

The bar to which the motion is transmitted when the stop motion works has, in the end which projects from the casing of the head, a square hole into which a pin fits. This pin is connected by an arm to a long vertical rod which runs down to the plane of the dial. Near its lower extremity another arm and a rod connect it with the rest of the motion. These connections are shown in Plate 3. When the vertical rod is caused to turn, it draws the horizontal rod shown in Plate 3 to the right. This causes a metal block to turn and releases a post, acted upon by a spring, to stop the machine.

Plate 3 also shows the bunch stop motion. A needle, which in this case is bent to a peculiar shape, is placed close to the two sets of knitting needles. If the yarn bunches up on the needles, this bunch catches on the needle point. Since the knitting needles and cloth are revolving, the tendency is to pull the point of the needle in the direction of their motion. When the needle is acted upon, it turns with its supporting rod and releases a post which springs up, due to the force of a spiral spring about it and brings an arm into contact with a post on the revolving cylinder. This post forces the ram through a small angle, and thereby, at the same time, forces a large ring under the machine to make a small portion of a turn. The movement of this ring causes the belt to be shifted and the brake to act.

Plate 4 shows the details of the belt shifting and brake releasing device. The large ring is located under the frame which carries the revolving cylinder, and is arranged so that it may slide in its supports. For each yarn feed on the head, there is a post projecting downward from the movable ring. Also, there is a bunch stop motion which has a post projecting down through the frame. Fastened to this post is a slotted arm which fits over the post on the movable ring and extends under the cylinder. The cylinder has eight posts, equally spaced, projecting from its lower side.

Under normal conditions, the arm is held low enough by the bunch stop motion post, so that the revolving posts on the cylinder do not come in contact with it. This position is illustrated by the dotted lines of Plate 3, showing the condition when "set." When there is a break in the yarn or a bunch on the needles, this bunch stop motion post springs up and carries the arm with it. In this position, the post on the cylinder strikes the arm and forces it in the direction indicated by the arrow. Because the post on the ring fits into this arm, the ring is forced through a small portion of a turn. One of these posts (on the ring) has a block fastened to it, with a rod projecting therefrom. These, of course, move with the post and the rod comes in contact with a trigger which draws back the support of the brake arm. This allows the brake shoe to come in contact with the pulley.

The belt shipper is held on a rod acted upon by a coiled spring which tends to keep the belt on the loose pulley. Under normal conditions; when the belt is shifted to the tight pulley, a catch falls into a slot in the rod and holds the belt there. When the movable ring is forced around, a block on it strikes the end of this catch and releases the rod, thus stopping the machine.

To have the conditions right for knitting, the yarn should pass freely and yet not too freely through the hole in the plate, and the spring in the head should be set so that the movable finger will normally be in the position shown but will be drawn inward if the tension becomes greater than normal. The needle of the bunch stop motion should be set so that there is no chance of contact with the fabric when the machine is making clear work, but so that it will catch on a small bunch on either the cylinder or dial needles.

Secure Signed Contracts.

Because a hosiery mill accepted an order from a jobber without having it signed by the jobber, the seller is unable to enforce the contract, notwithstanding the buyer admits placing the order with the mill's selling agent and the merchandise was shipped in accordance with shipping instructions on the order.

The transaction was in New York, one of a number of states in which the Uniform Sales Act is a statute. The New York Statute of Frauds with respect to the sale of goods is found in Section 85, which provides in part as follows:

> "A contract to sell or a sale of any goods or choses in action of the value of fifty dollars or upward shall not be enforced by action unless the buyer shall accept part of the goods or choses in action so contracted to be sold or sold, and actually receive the same, or give something in earnest to bind the contract, or in part payment, or unless some note or memorandum in writing of the contract or sale be signed by the party to be charged or his agent in that behalf."

In the case in point the jobber simply refused to receive the goods when offered by the railroad company, and as the order was not signed, the manufacturer is advised by his attorney that the contract cannot be enforced in an action at law.

Manufacturers have been prone to overlook the Uniform Sales Act, and even when it was brought to their attention, did not insist that orders be signed. Most jobbers refuse to sign an order, knowing manufacturers would rather bank on their honor than lose a sale. Disreputable jobbers will take advantage of the technicality, this being one explanation for the existence of the cancellation evil. Manufacturers will have one repetition after another of their recent troubles so long as they permit buyers to dictate terms on which goods are to be sold and delivered.

The Knit Goods Market

After more than two months of industrial stagnation, during which knit goods production was sharply curtailed, retailers all the while having good business, the market enters upon the period when distributors will be forced to make engagements for spring, and fill in for winter as well.

Adhering to the policy of liquidating stocks, in conformity with the Federal Reserve Bank instructions to convert merchandise into cash and buy only for needs, jobbers and retailers have refrained from purchasing for replacement, notwithstanding in several lines it has been possible to acquire goods at about the cost of yarn. Speculators to some extent took advantage of the opportunity, and considerable stock has been moved from holders, whom banks virtually forced to sell, at almost any price it was possible to obtain.

While much distressed merchandise has been unloaded by manufacturers who found themselves in a tight place, there is a question as to what quantities remain in second hands, and in the circumstances there appears full warrant for keeping closed mills idle a while longer and shutting down on production wherever it is not being absorbed.

The fact that there appears to be no end of hosiery lots at sacrificial prices has led some jobbers to observe that the reports of curtailment of production have been exaggerated; that enough mills are operating to supply the market. It is the general impression among them, however, that output has been cut so radically that it might be well to stick pretty close to the market, prepared for developments.

Jobbers in the main are showing just a trifle more interest and a considerable number of buyers are dropping in to pay respects to mill representatives. When given a price, however, they generally come back with a strong intimation that better figures have been quoted elsewhere. Several jobbers have been telling of the low prices offered by one large establishment, naming the price to competitors. The house in question denies it ever named such figures as two jobbers have reported, and the executive offers one hundred dollars to any person who will prove the quotations mentioned.

It is suggested that recourse to the old trick of playing one house against another evidences in the first place a desire to obtain merchandise, and a purpose to break the prices of any reputable establishment quoting. This alleged plan of a few buyers, it is stated, has influenced a number of mills to shut down entirely on production, for averting still further demoralization.

Despite the common belief that there must be resumption of buying in September, manufacturers are no more interested in yarns than six or eight weeks ago, and about the only cotton yarns moving are those which are being offered at or less than cost of cotton plus spinning. Manufacturers are out of the yarn market for the same reason that distributors are not operating—the disposition to liquidate. Then, too, they are wisely refraining from accumulating stocks, to be at the mercy of speculators, as in the last two months. Had mill operation continued throughout July and August on the basis of the level for June there now would be such a flood of stocks as would enable distributors to dictate prices and selling and shipping terms. In fact, several mills, as is commonly known, have given extraordinary datings. A southern mill, to obtain an order from a New York jobber who but a day before bought a few cases of hosiery, f. o. b. mill shipping, offered to ship f. o. b. New York. This was sufficient to induce the jobber to offer a cancellation, which, however, was not accepted. A few manufacturers have guaranteed their prices against declines. Everyone of those concessions is an entering wedge for a chain of evils from which manufacturers who encourage them will be yelling for relief.

The trade is as much in the dark as to future prices as a month ago, and few mills that declined then to take a chance on values will do so now. Manufacturers are waiting not only for jobbers, but for developments in the yarn market. On the basis of 60 cents for 10s single carded, it is held, hosiery for next spring cannot be offered under the near high prices of last year. As is pointed out by the executive of a large mill making cotton goods, fuel cost is twice as great as under the last previous contract for coal. Contracts at this time would show an increase of 30 per cent in packing cases and from 20 to 25 per cent in strawboard boxes, and within the last sixty days the mill has increased wages 10 per cent.

Pending a show of action by jobbers and something definite as to approximate values, further curtailment of the production of sweaters, hosiery and underwear seems certain, notwithstanding several hosiery mills making distinctive lines are operating to capacity full time and are in arrears with deliveries.

Mill executives who have come from the South in the last few days for a survey of the primary market, report factories idle and others operating part time. In Georgia, Tennessee and Alabama, it is stated, production has been cut all of 60 per cent in contrast with January. One mill is running on domestic retail and export orders and may continue in operation another 30 days. Among the idle factories are some of the large establishments. A few mills are working up yarns in stock, intending to close down so soon as these have been consumed.

In Reading, Pa., the hosiery industry is within less than 50 per cent of complete stoppage.

Philadelphia is turning out perhaps 40 to 50 per cent of the January production, certainly not more.

The output of silk hosiery is being materially lessened from week to week, and it is expected a number of mills which have been kept going in the completion of orders will shortly be in the idle class, the market for silks being in a less satisfactory condition than that for staple cotton goods.

Full fashioned silks for women have been offered at about the labor cost and mercerized half hose has been picked up by a few jobbers at less than the cost of the yarn on the basis of today's lowest quotations. The instructions from one large establishment to a local salesman are, "Meet your competitors' prices." That seems to be precisely what almost every salesman offering silks is doing. Meanwhile a large mill which recently opened its

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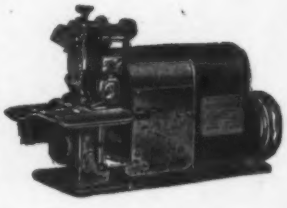

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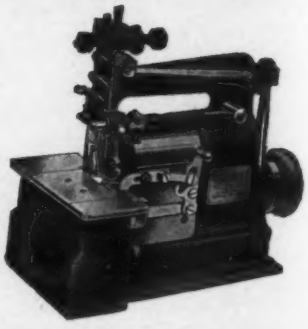

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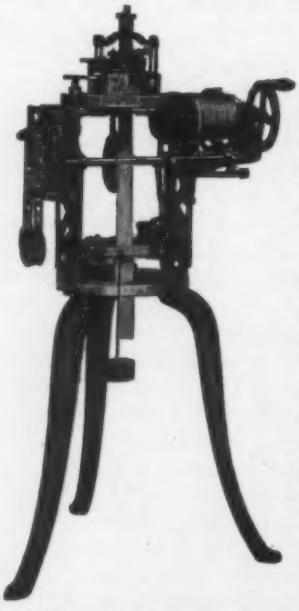

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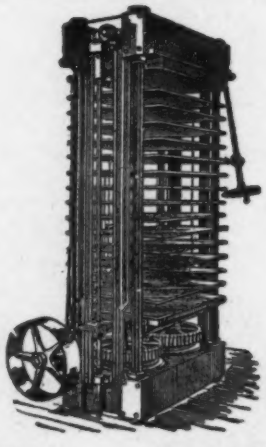

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lines is selling, in small quantity, at the designated prices.

A large jobbing house which bought heavily of ladies' full fashioned silks at around $27 a dozen is reported offering a large part of its holdings at $14.50. In the circumstances dealers in need of stockings of the type in question necessarily are not interested in offerings by manufacturers, which is given as one reason why more mills soon will shut down on production.

A representative of a large Broadway, New York, commission house several days ago started out for a tour of jobbers with a line of seamless silk half hose with cotton tops which he was authorized to offer at $6.75. He felt he had an attractive proposition, until he encountered a salesman from another establishment offering a silk sock with mercerized top at $6.50.

It is obvious that this sort of thing cannot continue, and it is encouraging that in lines in which there is no surplus mill and jobber are doing business on a rational basis, and, try as they may, distributors are unable to hide a very keen interest in future prices and the matter of deliveries.

A large mill specializing in heathers has not had a cancellation and is having requests for advance deliveries, and receives an occasional order. Some operators have not been so successful with their heather lines, cancellations being offered in considerable volume.

Ladies' sports and children's golf stockings have proven strong numbers with a mill operating extensively in these lines. The factory is operating full swing and will be late as to deliveries of large quantities.

The 84 needle cotton socks and bundled wool half hose of one large mill are off the market, the factory, although running to machine capacity, having sold up as far as it was thought prudent to sell.

While one mill is understood to have taken some business on infants fancy top socks, other mills have not named prices. A large lot of straight top socks for infants was offered last week at two dollars a dozen. The lot constituted an export order that did not stick.

Incidents come to light day by day showing an itching eagerness on the part of jobbers for protection against a bare market. One distributing house gave a mill representative positive instructions to cover for a moderate quantity of infants' socks. The mill office at once gave such assurance, but the price was left open. No material drop from figures, which would be justified at this time will occur, it is believed, yet some manufacturers are fearful that others simply are waiting for some one to start something, intending to come out later just a few cents per dozen under, for getting new accounts.

A central west jobber placed a hosiery order with a Pennsylvania mill, at value at time of shipping, deliveries December and January. The mill agrees to sell and the jobber agrees to take at the mill's opening price for spring. When the mill will announce prices it is not stated. The transaction stands on the honor of seller and buyer, each having absolute confidence in the fairness and integrity of the other.

The explanation is, the jobber feels that in view of the general closing down of mills there is likely to be a scarcity of staple hosiery when buying is resumed and t deferred orders will have little chance of getting through the mill before the tail end of the season. The jobber now feels assured of a supply of the line of hosiery in question and the manufacturer of at least one order that will keep the mill running until other buyers drop in. The order amounts to some hundreds of thousands of dollars. It would not have been placed at this time had mills continued in operation throughout the slump, piling up stock, it is admitted by one of the parties to the contract.

Transactions of this character may be expected to be comparatively few, for manufacturers as a class would not similarly engage with a jobber known to have canceled orders, nor would a jobber commit himself to a manufacturer having a reputation for attempting to dodge a contract in a rising market.

One thing about which there is no uncertainty is that merchandise taken in before the advance in freight, express and passenger rates will be a strong asset, in that it will have cost the distributors less than that yet to be received.

Taking into consideration the fact that the higher rates will affect every item in manufactures—materials, containers, packing boxes, etc.—and shipment of the manufactured product first to jobbers and leter to retailers, is estimated by the accountant of a large mill that, taking the average weight of stockings per dozen, the freight from points in the South to New York or Chicago and thence to retailer destination will amount to a probable ten cents per dozen.

A mill manufacturing underwear on a large scale and selling to the retail trade exclusively is offering its lines for spring, in an informal way, at prices about 30 per cent above the opening price last year, and 12½ to 15 per cent above the 1919 peak price.

Jobbers have said the public will not next year pay present prices for underwear. Some retailers apparently doubt this, for already a number of small orders have been placed with the direct-to-retailer mill, prices guaranteed against the mills declines.

It will be mid-September, probably, before jobbers begin to operate in spring underwear. Prices will be higher, for one reason the unwillingness of jobbers to operate and their announced intention to hold purchases down to about 25 per cent of what ordinarily would be taken. It is the purpose of manufacturers, so far as can be ascertained, to have production governed by contracts with jobbers, and to accumulate no stocks for their succeeding calls for merchandise. Underwear mills spinning their yarns plan to regulate their spinning departments by the pressure or lack of pressure on the knitting machinery.

Assuming that jobbers will buy on a 25 per cent of probable requirements basis, manufacturers contend this will not tend toward accumulations of stocks, for, it is pointed out, mills will be operated on a like basis. Much machinery is idle and the list of mills which have shut down on production is increasing steadily, so that there will be practically no stocks for deliveries as early as jobbers usually stipulate. Pacific Coast jobbers, who begin the season earlier than in the East, will want very prompt shipments, and, unless freight conditions improve in the meantime, considerable underwear will have to go to destination by express or reach distributors so late that distant retailers will suffer for want of merchandise. The situation may right itself as the season advances, but

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the outlook is not encouraging from the distribution standpoint or as promising relief from high prices.

It has been the hope of manufacturers that mill help, in view of the trade situation, would be willing to turn off maximum production, instead of skulking, as in the last several years, and that therefore an increased number of units per employee could be obtained, reducing the number of operatives, with the result that prices might be scaled somewhat. On the basis on which mills will have to be operated for adhering to a line of reasonable safety, it is stated, whatever saving might have been effected by improvement in help conditions will disappear in the higher overhead resultant from spasmodic operation enforced by the jobber policy of liquidation.

Winter garments have sold in phenominally large volume by underwear jobbers, but they are known also to have doubts as to what per centum of the orders will stick, and until doubt on this phase of the situation has been removed they will buy spring underwear with extraordinary caution, it is expected. A suggestion from a leading operator which has the approval of some mill heads is, "Buy conservatively, but don't starve your stocks; curtailed production, high wages, high prices of materials and increases in freight and express charges point to high prices."

Anticipating the noticeable falling off in the demand for shirts and drawers, which appears to be giving way to the combination suit as the more popular garment, several large manufacturers have discontinued entirely the making of single garments, diverting the machinery to other purposes. One leading establishment has not had a domestic order for shirts and drawers since April, barring occasional cases for filling in. Manufacturers of nainsook underwear have to a great extent shut off production, plants being idle and business at a complete standstill. But absence of demand is not bringing lower prices, except when distress merchandise is offered.

A well known operator in underwear, taking a philosophical view of a perplexing situation, regards it as nothing more than a case of cureable paralysis of purchasing power, such as afflicted industry and commerce twice in the last six years, in each instance the result of confusion. The outbreak of war and the armistice precipitated conditions which now are having a parallel. The present paralysis has continued longer, perhaps, than the previous attacks, and may continue for some time, this operator says, but he looks for a complete and sharp reversal of the present situation, (responsible for so many long faces and sleepless nights) to be felt the sooner if government authorities give up the attempt to regulate private business in defiance of the well established principle that demand brings supply and supply minimum prices.

Duplicate business in heavy weight underwear is still being withheld, and it is predicted not a few jobbers will receive a shock when late in the season they come to market to fill out for requirements. As is commonly known, mills in Cohoes, N. Y., where probably 70 per cent of the flat underwear is produced, have gone through a long period of idleness, due to labor troubles, and are not yet operating at a stage where it is safe to guarantee deliveries on schedule. It is is figured that at least 20 per cent of what should have been produced of this type of underwear has been taken out of production, a fact of which distributors are cognizant but which has not impelled them to guard against stock starvation, for the reason stated—they cannot tell what per cent of their fall orders taken from the retail trade will stick. Even the goods which have been thrown back on mills by jobbers canceling orders, it is stated, will not be sufficient for filling the vacuum that is being created.

Some jobbers, having bought from seconds hands at considerably less than replacement value, probably may be counted on as out of the market for the remainder of the season, but, as is pointed out, that which has left such holders will have to be replaced. A jobber states he recently bought of a well known line of fleeced shirts and drawers at $8.50, whereas the mill price is $11.25 and is being adhered to by the manufacturer, who is sold comfortably ahead. As illustrating how transactions of this kind sometimes terminate, it is recalled that in the slump of 1919 a jobber picked up 25 cases of shirts and drawers at $5.50, which was $1.25 under mill price. Within an hour he met a jobber from another city to whom he confided he was fortunate to stumble on "fifty" cases of the garments in question. "I don't mind letting you in for 25 cases," he said, "at $6.25. As this is 50 cents less than the mill is asking, I thought you might want to share in the find which I made."

"I'll take 25 cases at that price," said the second jobber, and the deal was closed, the first cleaning up 75 cents a dozen without investing a dollar. But inside of the three months he was back in the market and bought of the identical line at $8.50. That, it is predicted, is what is going to happen to a number of jobbers unloading heavy weight underwear in the present market. Again the consumer will pay prices based on replacement cost, which apparently will be above what it might have been.

Production of sweaters and kindred lines as a distinctive division of the knitting trades is estimated by well informed operators to have dropped fully 50 per cent from the level when work was commenced on early orders.

Cancellations have played no small part in the closing down of sweater mills, very few of which are operating full time or with complete organizations.

A large sweater house admits that technically most of the jobbers who have submitted cancellations are within their rights. In several instances goods were returned because the weight was from one-half to one pound less than stipulated. A delay of less than a week in completing deliveries has been a frequent pretext for cancellation of an order. Such minor breaches as, a year ago, never would have been brought to the notice of a shipper now are resorted to for voiding contracts, all indicating the general attitude of distributors toward sweaters.

The slump in sweaters became more pronounced in the last few weeks, due possibly to the knowledge of dealers that wool was selling at about pre-war prices, while approximately three times pre-war value is placed on the products of wool. It is regarded certain that if the public buy sweaters next winter as usual, there will be a late scramble among dealers for goods thrown back on mills, and with production sharply curtailed it seems apparent there will be somewhere materially fewer sweaters than may be necessary for the comfort of both distributor and wearer.

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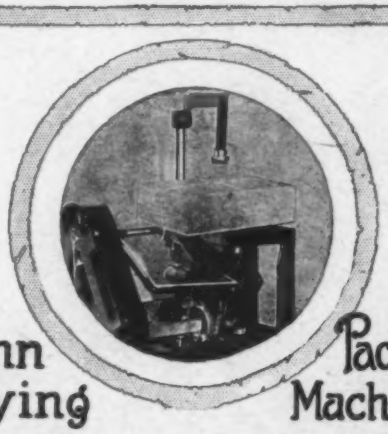

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We Make a Specialty of the Textile Business.

Business in bathing suits is reported having been hard hit. Sales, which at one time promised fair volume, have dropped off radically, dealers state. The demoralization is attributed by some interests to a display on the part of one or two manufacturers of undue eagerness to get business. Disturbance of a situation which at the start looked bright in a sombre market came with the naming of prices so low as to alarm buyers. What little stability appeared on the surface at the opening quickly disappeared, and now manufacturer and distributor are waiting, with the same interests in other knitted lines.

Some interests look for a sharp revival of buying, once it starts. It should not be forgotten that as much time is likely to be consumed in restoring confidence and activity as was wasted in destruction. Fundamentally, there is market soundness, notwithstanding dullness. Unfortunately, there has been much indulgence in the threats, tirades and warnings emanating from federal and state sources. Department heads have advised the public to not buy and now come along with nasty insinuations involving manufacturers. who are threatened with investigation as to why they are not operating their mills.

As a matter of fact, in the hope of establishing proof of a conspiracy to curtail output, representatives from the Department of Justice have investigated a number of mills to ascertain if there were warrant for closing down. The inquisitors were shown cancellations and were convinced orders were not forthcoming, and admitted manufacturers were being left high and dry. Still, they ask, "have there been agreements among manufacturers to close their mills?"

Business has been much interfered with by professional men who never saw the inside of a factory or had to go to bank to borrow money to pay for raw materials with which to make textile products for the masses, and have undertaken to regulate industry, from the mining and sale of coal down to the employment of a distinguishing label for a product.

From the same councils whence emanate edicts as to how much employers shall pay for service comes complaint that the product of that service must sell for less, under penalty of the wrath, and worse, of public servants whose duty, it was assumed, was to interpret and execute the laws rather than formulate ham-stringing rules and regulations for appealing to an excited public. Wages of miners, railroad operatives and express company employees have been arbitrarily increased, with which there may be no complaint on the part of the public, but it would seem it is time the public be made to realize that it must pay the price which it establishes, and not be pampered and encouraged in the hope and belief that all are entitled to the highest possible price for that which they have to sell and the lowest possible price for that which they must buy.

"Hydro-Electric Developments" is the title of a 32-page bulletin being distributed by Charles T. Main, engineers, 201 Devonshire St., Boston. The purpose of this booklet is to show in part the work of the Main organization in the design and supervision of water power structures and hydro-electric systems throughout the country. Photographic reproductions showing some of the work accomplished include several textile plants.

Among the Knitting Mills.

The Lebanon Mill Company, Pawtucket, R. I., has filed plans for the erection of a two-story addition to its plant. It will be 50 x 90 feet and is estimated to cost about $25,000.

The Vassar Swiss Underwear Company will remodel an armory building at De Kalb, Ill., for a new knitting mill. The structure will be one-story and the proposition is estimated to cost about $50,000.

The H. C. Aberle Company, Philadelphia, Pa., manufacturer of hosiery, has arranged for the erection of a new plant. It will be five-stories, brick and reinforced concrete and is estimated to cost about $250,000.

The Waterbury (Conn.) Underwear Company has been incorporated with a capital of $30,000, to manufacture knit goods. The incorporators are Louis Gibelman, Max Gibelman and Morris Saldman, New York.

H. E. Stamm, Hagerstown, Md., will build a new two-story mill, 40 x 104 feet, for the manufacture of hosiery. It will cost about $20,000.

The L. L. Knitting Mills, Brooklyn, N. Y., has increased its capital from $15,000 to $50,000.

The Signet Mills, Inc., West New York, N. J., has been incorporated with a capital of $25,000 by Nicholas S. Schloeder, Harry Cahn and Benjamin Siegel, to manufacture knit goods of various kinds. A local plant will be operated.

The Wearwell Knitting Corporation, New York, N. Y., has been incorporated with an active capital of $20,000, to manufacture hosiery. The incorporators are J. L. Sheppard, C. A. Pogson and J. F. O'Neill.

Plans are being made by the Calton Hosiery Mills, at Spartanburg, S. C., for the enlargement of their plant and the installation of a finishing department.

The Blue Ridge (Ga.) Knitting Mill has been organized with a capital stock of $30,000. The officers are: M. C. King, president, McCaysville, Ga.; William Butt, vice-president, and J. F. Holden, secretary, both of Blue Ridge.

The Priester Hosiery Mills, Paducah, Ky., will erect a two-story and basement addition to their plant.

The Texas Hosiery Mills have been organized at Dallas, Texas, with a paid in capital of $100,000. This will be the pioneer hosiery mill in Texas. It is expected that operations will begin about December 1. The plant will work on children's hosiery and will have a dyeing and finishing department. The equipment, when installed, will include 100 knitters, 115 ribbers and 20 loopers. The mill will be electrically driven. The product will be sold to jobbers.

Twelve members of the Cartersville (Ga.) board of trade recently raised $24,000 as additional capital stock of a knitting mill now in course of construction at that place at a cost of $100,000.

Construction of a group of modern cottages for homes for its employees has been started by the Elizabeth City (N. C.) Hosiery Mills, and the company intends building a model community for its several hundred employees. Each house will cost from $2,500 to $3,000 and no two will be built alike.

Efficiency is not a mysterious thing; it is the result of steady, earnest application to one's work.

The Atlantic City Executive Meeting

The most comprehensive survey of the knit goods market since the world went on strike against buying was had at the annual meeting of the Executive Board of the National Association of Hosiery and Underwear Manufacturers, in Atlantic City, July 30-31, when the first week in May 1921 was designated as the time for the Association's annual exhibition of machinery, yarn, dyes and mill supplies, to be held in Philadelphia. The convention will run concurrently, sessions to be held in the forenoons of Tuesday, Wednesday and Thursday, concluding with the annual dinner on Thursday evening.

The Executive Board saw the need of more attention to the training of men for the knitting industry by the regularly established textile schools, and on motion of Champe S. Andrews, Cotton States Hosiery Mills, Chattanooga, Tenn., President S. D. Bausher was directed to appoint a committee of three persons to investigate the several textile schools and report back which of these schools is the better able to supply the needs of the knitting trade for technical men. The committee also is to recommend by what means and to what extent the National Association of Hosiery and Underwear Manufacturers can be financially helpful to the school found by the committee to be best equipped for serving the knitting trade.

Discussion of prices, which generally forms a large part of the deliberation of meetings of this character, was not indulged in at Atlantic City. It was regarded plain that the question of price did not enter into the present situation; that lower prices would not result in increased demand until liquidation had run its course. What prices are to be named when liquidation is through is not a matter of guess or prophecy. Prices will depend on conditions at that time. One outstanding view was that manufacturers are unwilling to name prices now or for the future that do not assure a reasonable margin of profit to those naming them.

Lack of adequate transportation facilities, it was reported by manufacturers, made it extremely hazardous to continue operating, in that semi-raw material is delayed in transit and there is no assurance as to how long it might be necessary to hold manufactured goods before being able to ship out. In one instance a large shipment of hosiery which could not be made by freight was gotten through by auto-truck and express at an added cost of eleven cents per dozen.

The credit and transportation situation were viewed as chief among the factors in the stoppage of industry. Reaction, it was thought by speakers generally, would first be felt in the distributing trade. Industry, it was suggested, will make quick response to demend, but will not resume actively until necessity for production be shown. The meeting was not unmindful of the perplexities of the distributors, but regarded extreme conservatism in industry essential for more quickly restoring stability and safety for all interests.

Most important of the trade condition reports submitted was that of Garnett Andrews, Richmond Hosiery Mills, Rossville, Ga., who but a week prior to the meeting returned from a three months' tour of leading European countries, after a very close observation of trade conditions. Mr. Andrews traveled by automobile, by train and in several instances by airship, in order to make as comprehensive a study of the situation as possible. He was accompanied by a skilled interpreter and visited not only factories, wholesalers and retailers, but interviewed government officials and did not neglect to get the opinion of the man on the street.

A positive shortage of knit goods supplies is everywhere to be seen in Europe, said Mr. Andrews, and the only reason why export business ceased was the fact that alarmist reports from the United States, predicting lower prices, were spread by the sensational press of Europe.

Buyers in the principal British and European markets admit a very keen demand for some lines of textiles. In some instances wholesalers' stocks are near the point of total depletion, it was the conviction of Mr. Andrews, formed after careful research into the actual condtions of stocks of merchandise in Europe. It was his opinion that buying will be resumed on a very large scale in this country so soon as liquidation has proceeded far enough to lessen the credit strain, and that the buying wave will spread to the European countries in a remarkably short time after buying has been resumed in this country. This extraordinary situation, it was predicted, must inevitably result, in the opinion of every person joining in the discussion, in an acute demand for merchandise which, unfortunately, will come at a time when mills have no accumulated stock, with more or less disorganized conditions of operating departments, due to the long and continued shut-down of the mills.

The situation in the domestic markets was covered in reports from investigators of conditions existing among mills, jobbers and retailers. Numbers of instances of retailers deferring purchases, notwithstanding stocks in some lines are totally depleted, were cited. Ten department stores were visited in turn in quest of a certain standard grade of ladies hosiery. Assortments as to sizes and colors were so badly broken that not a single pair of the specific grade could be found. Retailers, it was learned, had sold in very large volume, but had not bought for replacement.

Authentic reports were presented of jobbers who, in turn, following the same process of liquidation, were unable to fill a customer's order for certain grades. They were not declining such orders but, to complete their liquidation in the shortest possible time, were filling them with hosiery, sweaters and underwear costing, in specific instances mentioned, materially more per dozen than the prices stated in the orders from the customers. In other words, the wholesalers were not permitting a substantial loss in merchandise to prevent them completing their liquidation.

It had become apparent that retailers in immediate need of merchandise whose wants could not be supplied by the jobbers with whom they had been trading were, in many instances, imploring mills to sell them in assorted case lots. A hosiery mill in Ohio received in one week calls from four retailers who always have bought from jobbers. Re-

tailers, it was stated by a direct mill representative, had bought of a certain line of sweater coats to an extent that jobbers who recently came into the market were unable to buy for the deliveries which had been contemplated by them.

In a discussion of this phase of the market situation, several manufacturers felt that mills should not invade the retail field while their jobbing friends were wrestling with the acute problem of liquidation.

Jobbers, it was stated, had come to manufacturers for samples, in the expectation that they would be ready to buy "in October." Neither of several mills reporting requests of this character was willing to make commitments for samples except as a part of an order, in line with trade custom, and because of unwillingness to deceive jobbers into the belief that merchandise could be delivered in October, with production actually discontinued. There is no self-starter to the knitting industry, one manufacturer observed, nor can you by the turn of a crank start the wheels moving. Starting a mill, after a long shut-down, is as intricate a process as making a watch from a jumble of springs, wheels and ratchets.

A buyer for a considerable quantity of a distinctive type of light weight half hose was reported having taken his wants direct to several manufacturers of this particular line. Mills not closed down were preparing for a stoppage with a completion of orders, and manufacturers did not deem it expedient to operate for turning out a limited quantity in this one line.

Teaching the Man in Overalls to Think Right.

Only a few years ago psychology was an unknown quantity in industry—the need was felt by a few but the real value of knowing the minds of men and the causes for conditions, present and past, was conspicuously absent. The war brought forth many miracles, but perhaps none so great as the knowledge of the cause for wrong thought.

In those days preceding the entrance of the United States into the conflict, there was a gigantic need for productivity; afterward this need became still greater and more necessary, and employers adopted every sort of an idea presented to them to induce workers to toil hard and steadily.

During those days many a contract was cancelled because of delayed production. Strikes were many, much time was lost and almost every sort of method was tried and found wanting. Taylor, of scientific management fame, although his ideas had been and were still found to be basic, did not prove entirely successful because workers balked at time studies and stop watches—in fact any sort of a short cut was taboo.

The radical unionist was placed in the same category as the pro-German. The American Federation of Labor was given scope never before dreamed of and apparently did its best but failed. Much was laid at the door of the Administration—some of which undoubtedly belonged there—but conditions improved very little. Wages increased amazingly, the working day grew shorter, concessions of all sorts were made, but still production continued to decline.

Practically everything adopted which was in any way successful dealt with technique, was mechanical and automatic and had little to do with the human heart and thought part of the question. Patriotism even fell short in bringing stable results. Things were bad.

Finally it gradually dawned upon a few of the broader minded employers that human principles, based on human motives and followed up with human acts were the essentials if production was ever to be increased to the necessary proportions.

In the past, amalgamation of interests both among employers and employees, had resulted in limited production and much misunderstanding of intentions. Petty jealousies were found to create havoc with any supposed unity of material interest.

Then slowly but surely the problem began to shift upon those shoulders where it correctly belonged—selfish and bigoted plans and actions, one-sided and inefficient, were laid aside for better and more equitable arrangements. Not a few small and large concerns were taking advantage of the opportunity and Sherman Service was proving itself most practical and unique. Gradually one manufacturer would tell another, and to several hundred plants came a period of content together with the correct quality and quantity of production.

The aim of Sherman Service is to so develop workers, male or female, in groups or singly as occasion demands, that they may understand common economies and handle their own problems.

Bargains, understandings and agreements must naturally be handled by the two groups of individuals affected—the employer and the employee. Industry needs no outside interference so long as the rights and interests of the general public are safeguarded.

Sherman Service deals solely with viewpoints. It works among those human beings who make up industry, and studies their thoughts and acts, no matter whether they be employers or employees. It finds out why the radical way of doing a certain thing, which is contrary to contentful industrious efforts, seems popular and then it changes that viewpoint into proper channels for production purposes. For more than ten years it has been securing viewpoints and where they were wrong, correcting them. For every destructive word heard a constructive suggestion has been offered.

It's a matter of personal education.

And so Sherman Service has grown from a little to a big institution almost in spite of itself. Demands have been made upon it which were hard to meet, but it has accepted the responsibility placed and made good. It is frequently called "production engineering" or "industrial coordination" because of no more fitting title. It is really the humanization of all the component parts of industrial relationship; it handles, deals in, corrects and constructs the human viewpoints of the employer and employee alike. Its objective is to increase the quality and quantity of production through the establishment of such ways and means as will be understandable, above-board and mutually profitable.

The failure of so many to manage and lead or acquire large wealth is due not so much to the social and industrial system under which we live as to their own individual qualities or lack of qualities.—*Albert W. Atwood.*

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Successors to A. D. SALKELD & BRO., Inc.
ALL NUMBERS COTTON MERINO **YARNS** ALL COLORS WOOL WORSTED
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It pays us to make our yarns as good as we can because we have no trouble either in selling them or keeping them sold.

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Manufacturers of
NORTH CAROLINA PINE BOX SHOOKS

ADVERTISING conserves the buyer's time by acquainting him with a product at his leisure, long before the buying need arises.

The Yarn Market.

The depression that has prevailed in the Boston cotton yarn market for the past month has gradually become more marked until, at this writing, the market is about as near to an absolute "standstill" as it has been in the memory of many old time yarn merchants. Prices have been easing with the passing weeks and one of the larger merchants frankly states that it is now a case of being unable to give yarn away. Of course, that statement is more expressive of general conditions than it is of representative facts, for sales are being made on a small scale practically all the time.

Many of the trade refer to quotations as "erratic" during the chaotic conditions now existing in the market, while the spinners become more reconciled to meeting the price ideas of buyers. Spot yarn can be purchased at lower rates than spinners quote without very much difficulty, however, where consumers and in a few cases even spinners elect to liquidate rather than hold their full supply of yarns under existing credit restrictions. In expressing the opinion that prices cannot drop much further unless raw cotton sells much lower than 40 cents for spot, spinners say that cotton yarns have declined 40 per cent on carded and 25 per cent on combed. They say that this has come entirely out of profits. Comparison of prices show that yarn is now selling nearly as low as it did a year ago, more especially on the lower counts. In at least two instances prices are lower, for warp twist weaving yarns. In the case of 20s two ply, the price is now three cents lower than a year ago when it brought 76 @ 78, and 30s two ply may now be purchased for 85 @ 90, which is 10 cents lower than a year ago.

Inquiries which were for small lots a month ago, show no improvement with buyers apparently satisfied with purchases of the hand to mouth variety at low figures and showing no desire to cover future needs. This has now become rather common among practically all branches of the buying trade. One result is that some spinners, in efforts to induce business, show readiness to trade on late months at levels that appearently mean lower prices for raw cotton than those now talked in the cotton market. But lower prices do not seem to attract business.

Curtailment, the alternative to continued dullness, has already been started throughout New England's textile centers. Many mills in New Bedford and Fall River and throughout Rhode Island are "temporarily closed" or plan such action in the immediate future. Some announce it to be for employees to enjoy their usual vacation at this time of year, while others frankly admit the shut-down to be forced by the business depression. The five-day week is rapidly being adopted by such mills as continue operations. In New Bedford alone the recent curtailment has effected more than 720,000 spindles and 11,000 looms, while Fall River is a close second.

Many of the trade blame the present stagnant conditions to the slump in tire yarns. They recall that tire yarns led the upward tendency of the yarn market until abnormal heights were reached, other yarns following in the wake. Finally when demand for tire yarns weakened, following what is described as overproduction of tires, prices came down with a crash. Other yarns of course followed suit to some extent.

Recent quotations on the Boston market on representative numbers follow:

Southern Single Carded Cones.

10s	64@	65	12s	65@	66
14s	66@	67	16s	67@	68
18s	68@	69	20s	69@	70
22s	70@	72	24s	71@	73
30s	84@	85	40s		$1.35

Weaving Yarns—Warp Twist.

10-2	64@	65	12-2	65@	66
14-2	70@	71	16-2	71@	72
20-2	73@	75	24-2	82@	84
30-2	85@	90	36-2	$1.30@	$1.35
40-2	$1.40@	$1.45			

Northern Carded.

10-1	71@	73	16-1	73@	75
20-1	77@	78	26-1	82@	85
30-1	95@	98	40-1		$1.50

Northern Combed.

10-1	$1.00@	$1.05	16-1	$1.10@	$1.15
18-1	$1.18@	$1.21	20-1	$1.20@	$1.23
26-1	$1.25@	$1.30	30-1	$1.35@	$1.45
36-1	$1.68@	$1.70	40-1	$1.75@	$1.80

The Philadelphia cotton yarn market in August was featured with a marked continuation of the downward movement in prices. Another noticeable item was a decreased inquiry, both in volume and character. These, together with other natural attendant conditions, made last month's market practically a repetition of that of several months preceding. This was the general condition; in some cases certain counts seemed to display an effort towards a revival in activity, with their prices trying also to recover, but on the whole the market was a dull one.

A decreased activity in automobile tire yarns was reported during the earlier part of the month. One cause of this, it was pointed out, was that a number of tire fabric manufacturers have put their plants on a three-day week basis, others cutting off production by a discontinuance of their night shift, and still others adopting other methods of curtailment. Action of this sort will logically decrease the usual consumption of the yarns used for this class of work.

Further indications that a reversal is underway in the prospects for this outlet for cotton yarns was furnished by the reports that some of the larger tire manufacturers have cancelled cotton contracts and have reduced their orders for fabric. One instance was cited in which a tire company offered cotton for sale, after an inquiry among its agencies showed that business had slowed down. This easing off in the tire business is pointed out to have been caused by the combination of several conditions. Some state that the rising price of gasoline has caused many motor car dealers to cut down their weekly mileage to a certain limit. Others state that another factor contributing thereto is the fact that there has been a marked decrease in the number of new automobiles purchased and an almost similar decrease in the output of new cars. It seems to have appeared that the limit has been reached in the ability of the country to purchase motor vehicles. Many yarn spinners and distributors have begun to consider this a warning against committing themselves to any extent in the tire yarn business for delivery during the last half of the year.

Taking up the market specifically, weaving yarns had only a few scattered orders, and as most weaving mills are running on reduced time, they are only buying as they need the yarn for filling in. In some counts it is not always easy to locate stocks on hand in the yarn market in Philadelphia, but the limited demand for yarn for weaving purposes seems to be easily satisfied.

There was also a comatose demand for yarns for knitting. Mills using these yarns always were anything but active buyers and with the dull period prevailing as to the business they were doing, there was scarcely a request for knitting yarns.

As to combed yarns, this class has been so dull that few have attempted an approximation of the real trading value of the different counts. What one factor regarded as a high price was regarded as low by another factor, and vice versa. It seemed to depend upon the situation governing each specific sale, as the price mentioned in one instance was seemingly discounted in the next.

Mercerized yarns appeared to take a similar relative position with combed yarns, with practically no demand, low tide trading and all kinds of prices being named.

That is the general attitude of the bears while the bulls hold that prices will retain the present level, at least, and some indicate an increased demand is expected in the not far distant future.

The new freight rates are generally approved by dealers in the Philadelphia market. No one seems to worry about the extra one-quarter to one-third of a cent a pound on cotton yarn shipments which it has been estimated will entail as a result of the new award. In fact, the general opinion is that the new rates are fair and should occasion no complaint if they are found to be the means of improvement in transportation service, as the Philadelphia yarn market has a good many wrongs to be righted in this connection.

Recent Philadelphia quotations follow:

Southern Single Skeins.

4s to 8s	58		10s	60	
12s	61		14s	63	
16s	64		20s	68	@69
24s	74		26s	76	
30s	79				

Southern Single Warps.

8s	62		10s	63	
12s	64		14s	65	
16s	67		20s	70	
26s	82		30s	85	
40s	$1.25				

Carpet and Upholstery Yarns in Skeins.

8-3-4 slack	51
9-4 slack	51½
8-3-4 tinged tubes	46
8-3-4 hard white warp twist	51
8-3-4 hard twist waste	45

Southern Two-Ply Skeins.

8s	61		10s	62	
12s	63		14s	65	
16s	66		20s	69	
24s	75	@77	26s	80	
30s	80	@85	40s	$1.10	

Southern Two-Ply Warps.

8s	63		10s	64	
12s	65		14s	66	
16s	67		20s	69	@70
26s	75	@77	30s	80	
40s	$1.15				

Southern Two-Ply Combed Peeler Skeins and Warps.

20s	$1.30	24s	$1.45
30s	$1.55	40s	$1.70
50s	$2.00	60s	$2.15
70s	$2.50	80s	$2.75

Southern Frame Spun Carded Yarn on Cones.

8s	60	10s	60
12s	61	14s	62
16s	64	18s	66
20s	68	22s	69
24s	72	26s	73
30s	78	40s	$1.10

30s tying-in	75
30s double carded	80

Northern Mule Spun Carded Yarn on Cones.

10s	70	12s	71
12s	71	14s	72
18s	74	20s	75
24s	78	26s	80
30s	$1.00	40s	$1.20

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	$1.05	12s	$1.07
14s	$1.08	16s	$1.09
18s	$1.10	20s	$1.13
22s	$1.14	26s	$1.20
28s	$1.25	30s	$1.30
36s	$1.50	38s	$1.55
40s	$1.60		

Ribbed Hosiery

BY WILLIAM DAVIS, M. A.

PART TWO.

In the article in April COTTON the mechanism of an automatic hose machine was described in detail and the present article is intended to afford particulars of actual hose and half-hose made on this machine so as to give a broader idea of this very important branch of the trade in knit goods. The hosiery made on this class of machine is not so stereotyped as was the case several years ago for the present season has seen some striking innovations in the line of ribbed hosiery for ladies' wear. In the past they have been content largely with the plain article and if the ribbed footwear was adopted it was only done in a few standard patterns and shapes. The writer has just seen a range of ribbed hosiery for ladies wear with display features which are certain to become more pronounced as the seasons pass for there is no finality.

The tendency for the moment is to have the hosiery match the patterns of knitted coats and woven costumes. So firmly is the tyranny of the knitted coat being established at the present time that the maker of woven costume cloths is being approached by merchants to secure woven fabrics which will suit the prevailing styles and colors of knitted coats for the sport's goods trade. This is indeed a reversal of the policy of some few seasons ago when the knitted product for outer wear was looked upon as a temporary upstart by the maker of woven goods and the vogue was regarded as being merely a passing one.

Now the two branches of clothing are interdependant and the enterprising manufacturer does well to keep wide awake to the developments in kindred branches of the clothing industry. During the present season a strong demand has sprung up for wide ribs in the trade in knitted coats, 20 stitches or so of face fabric being made to alternate with 2 stitches of back fabric stitches. This has been further introduced into the trade in ladies hosiery for we find some of the larger styles of rib stitches being employed with striking effect and rib paterns such as 4 and 1, 5 and 1 4 and 2 and 6 and 2 are being noted in the stores. All this points to development in this class of goods and success will meet the boldest spirits amongst the manufacturers of knit goods, for there is always a large clientele ready to support ideas in the industry which have the appearance of novelty and style, anything to be different from the rank and file. The latter do get hold of it eventually but by the time that they have rubbed their eyes to the novelty and are prepared to emulate, the knowing ones are on a fresh track and seeking pastures new. This class of trade is more troublesome to secure and requires very much greater exertion, but has its compensation in the form of increased interest in the work and incidentally the enlarged profits which accrue. It is not a branch of trade which lends itself to mass production of the "bread-and-cheese" variety, but the manufacturer is usually able to make up for this by obtaining an enchanced price which his clientele are not unwilling to pay.

The first example is one which will be of little service to the American trade on account of its weight and thickness, and this is shown in detail in Figure 1 where the various parts of the article may be recognized as follows: A, the rib top of the sock, B, the leg, C, the heel, D, the lower foot or sole and E, the toe. This article is made on the 84 needle machine, where there are 84 needle tricks or cuts in the circumference of the upright cylinder whilst there are a further 42 cuts in the dial arranged vertically above the cylinder as was previously described. In Fig. 1 the rib top A is worked in the 1 and 1 rib stitch to the length shown when the machine automatically changes the needles so that the rib pattern for the leg is altered to 3 and 1 rib stitch. This is done by drawing down into the lower cylinder every second needle in the upper dial so that the rib becomes 3 and 1, that is every alternate back rib is replaced by a face row of stitches right round the circumference of the sock.

When the heel portion is reached the needles in the front half of the dial or upper cylinder automatically transfer into the lower cylinder so that all stitches in the front

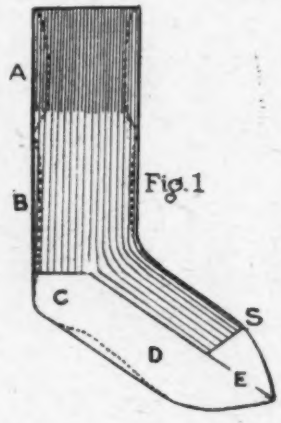


Fig. 1

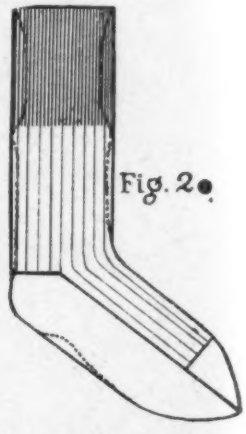


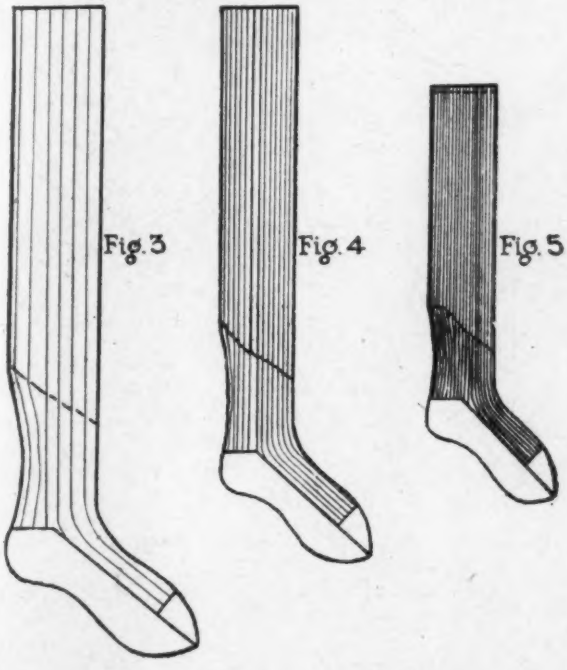
Fig. 2

half of the lower cylinder are plain in character whilst those in the back half of the cylinder are in 3 and 1 rib same as the leg. When the heel C is finished the circular piece is continued for the foot as at D where half of the foot is in the 3 and 1 rib whilst the under part is plain in character. The toe E is then made exactly the same as the heel and the next article commenced on the machine. The line indicated by the letter S right across the toe indicates the only seam which has to be made in half hose worked in the manner described for it is those stitches which in cutting one hose from another hang loose and have to be secured on a seamer or looper.

The diameter of this knitting machine is standard men's size, or 4¼ inches and the ankles are automatically stiffened which is important, as there is no fashioning at the ankle which should be so much narrower than the leg proper. The rib top grips the leg and maintains the article to a certain extent in its place but the ankle tends to appear untidy if means are not taken to produce a shortening of the stitch so as to reduce the width at this point. The counts of yarn employed in this gauge is 3/12s worsted for a good, heavy, winter weight.

Figure 2 illustrates a hose made on a finer gauge of machine which has a more dressy appearence on the wearer. This is a much finer gauge machine where there are 152 needles in the circumference, the diameter being 4¼ inches

as before. In this illustration the rib top is 1 and 1 rib stitch but every third needle only is allowed to remain in the upper cylinder for the leg portion so as to give a 5 and 1 rib pattern for the leg and upper part of the foot. This is one of the larger styles of rib pattern previously referred to which give a more elegant appearance on the wearer. The larger rib has one disadvantage which should be noted and that is the way in which these single rows of rib stitches in a vertical direction tend to mark the wearers leg owing to the fact that the back fabric loops protrude above the level of the ground texture and as these come into direct contact with the skin they mark the leg in a manner which tends to give a certain amount of initial discomfort to the wearer. This is not so pronounced with the smaller styles of rib stitches for these present a more level surface to the leg and the markings are not so plain. Again with the larger style of rib we do not obtain an article of heavy weight for it more nearly approaches the weight of the plain hose, on the other hand the larger ribs are very



effective as variations on the normal standard types of hosiery. The yarn used in this sample would be about 2/20s worsted counts. The shape of the illustrations is entirely diagrammatic and the dotted line represents the form when finished. They are boarded out on curved forms when still in a damp condition and the heat of drying enables them to fix permanently in the curved shape. A very important feature in lengthening the period of wear is the splicing yarn introduced at the heel and toe where so much extra wear occurs. This re-inforcing thread is introduced automatically at the part desired and is then cut off again when these sections are completed.

Ladies ribbed hosiery enjoys a large popularity for women and girls and Figures 3, 4 and 5 represent staple classes of the goods. Figures 3 affords a view of a full size hose worked throughout in the 4 and 1 rib stitch. A suitable gauge of machine for this article is one having 144 needles in the upright cylinder with 4¼ inch diameter. This machine would be suitable to work 2/21s to 2/24s worsted counts of yarn and one machine is stated to produce 16 dozen pairs of ladies' hose in 56 hours, while the weight per dozen pairs of this style would be about 3 lbs. It will be noted that the hose is fashioned at the leg towards the ankle portion this being done automatically by the method of reducing the number of ribs in the leg. This is more efficacious than merely contracting the tension as was done in the case of half-hose, as when the wearer draws the article off and on this contracted portion soon stretches and the stocking becomes unsightly. This is an unfailing test of good quality hosiery. Sometimes the contraction to the ankle is merely performed by the boards in finishing in which case the hosiery soon stretches.

Another feature of the non-fashioned product is that the leg is given too little material whilst the ankle has too much so that the leg portion often shows attenuated texture followed by a thickened portion for the ankle. To save great trouble in finishing and obviate complaints from the wearers, the leg portion should be knitted at the right width and the ankle portion fitted to shape by actual reduction in the number of stitches in the circle of fabric, this reduction taking place gradually as indicated in the diagram so to correspond with the curved form of the leg. Shaping or fashioning in reality takes place at angles and along straight lines and the curved form proper is induced by drying the article on suitable shaped boards.

Figure 4 gives another variety of standard article for this class of trade where the gauge of the machine is finer, there being a set of 162 needles on a diameter of 4¼ inches. The style of rib here portraied is the 2 and 1 which makes the article although finer in gauge still heavier in comparison for this is shorter in length and suitable for a girl's or misses size. Figure 5 afflords another illustration of a small size of girl's hosiery where the rib is the most frequent possible, namely the 1 and 1 stitch throughout with corresponding reduction in the width of the leg towards the ankle as shown in the figure. For this branch of trade the shape of the leg is a most important matter and many manufacturers prefer to make the legs in flat portions on the rotary frame and transfer them to the automatic circular machines to have the foot, heel and toe attached. The leg is afterwards joined by a seam up the back whilst the foot is attached as for the standard article. This system has the advantage of giving increased production and is often adopted by firms who have a large plant of rotary machines as these can be efficiently utilized for the making of legs and the shape is thereby all that can be desired. At the same time the making of the feet in these frames is attended by a considerable waste of time in transferring the sole and heel pieces and making the feet in sections. In this way it is not possible to use the machine to its utmost capacity for the worker has to be constantly stopping to make changes and preparations for the next stage of the process.

On the other hand we find many complaints in the trade against the style of foot worked on the automatic circular hosiery machine, and the writer is not quite sure that these objections are not well founded. By the method of production, the machine makes a shaped pocket for the heel and the toe and as it is not feasible to vary the size of this very much, the general objection is that the heel is too small for purposes of satisfactory wear. By the manner in which it is worked, it tends to be contracted in size and as a result the fabric stretches just at that point where a maximum of strain and wear is apt to occur.

This leads us to consider the chief points which a buyer should search for in making an estimate of the value of any particular lot of hosiery submitted to his inspection. The fully shaped seamless heel and toe has just been referred to and in contrast with this we have the fully fashioned heel which perforce must have seams along each side of the foot and the heel also will have a strong seam which attaches its two sides together. Just at the apex of the heel will be found the juncture of the vertical with the horizontal seam and here is a strong tendency for the yarn to conglomerate and form a bunch of material as a hard piece. Now to have such an obstruction located at the tenderest portion of the foot is a distinct disadvantage and examples of this defective article turned out from knitting factories have done something to bring odium on this class of product. The result is serious, for if the owner persists in wearing the stocking then he will become lame in a short time, if he endeavors to remove the defect in his own way by cutting through the material, the chances are very strong that he will sever the joining threads and with little further wear the whole part will unravel and a large hole be formed. The fashioned heel as performed on the full-fashioned machine is characteristic by reason of the roominess possible, it is more to the square shape with the extreme edge tapered off and this fashioning can be enlarged or modified to suit the particular size without much difficulty.

Another point to note in the judging of hosiery is that of the leg shapings which have just been described in detail. The examiner should note whether the leg is shaped entire on the boards in finishing when a good test, in the case of woolen articles, is to steam the portion in the region of the ankle in the vapor of a kettle; this will soften the material and enable it to be stretched almost to its original dimension. By this means also we may learn whether the article has been partially shaped by the tension of the yarn being tightened in the machine. In the case of real fashionings, the diminution in the number of ribs are noted at the back of the leg, or in the case of fine plain stitch goods made full-fashioned on the rotary frame, the narrowings will be plainly visible where the stitches have been superimposed on each other.

Another point of inspection is the welting and the rib top of these articles. The welt consists of the rows of plain loops made at the commencement of a stocking which gives a clean edge to the top and in the case of ribbed hosiery this is done by making a few courses of loops to begin with on the upright needles only, these courses folding round and forming a clear edge when the rib is commenced a few courses later. A very common defect in these articles and one to be carefully noted by the manufacturer as affecting the quality of his goods is to have this welt either too slack or too tight.

If it is too sleezy in loop structure, the top will appear slack and untidy, the edge will show puckered and will fail to grip the limb of the wearer at this point. If the welt is too tight then it will exhibit a strong tendency to break its thread and the result will be to have the fabric unravelling and forming a ragged edge.

In the case of ladies' ribbed hosiery the whole article is worked in the rib stitch and one does not generally have the top portion of a different stitch of rib. The whole article is destined to exert a greater grip on the leg and thus induce greater comfort in wear particularly for the winter season. In plain hosiery, on the other hand, we generally have either a rib top of several inches in length or an overlap where the plain fabric is folded two ply and joined. In some cases this overlap of fabric is done by merely doubling over the existing welt and seaming it further down in the ordinary way this giving a thickened part several inches from the top, which is seamed separately by a worker. If the top is made first and later joined into the leg fabric by re-transferring to the needles once more then subsequent seaming is entirely avoided and the fabric preserves its continuity of stitch.

To find the weight per dozen pairs of the articles when finished is quite simply done by the ordinary methods of weighing but no manufacturer would weigh by the usual method of weighing a dozen pairs and taking the total, for so many stockings are not always available. For this work a special instrument is employed, worked on the spring balance principle and the weight per dozen is obtained by putting one pair in the scale pan. The machine has two indicators, one which registers the weight of the material deposited in the pan and a second which shows at a glance the equivalent weight per dozen pairs. In the case of woollen or silk goods it makes some difference whether weighed in a dry atmosphere or a damp one, and it is well known that small deficiencies may often be corrected by placing the goods in an atmosphere which is slightly more damp.

Under present conditions this device does not always work for the effect is at once neutralized if the buyer elects to weigh the goods in a dry atmosphere. Normal conditions of atmosphere should be selected to do the weighing in and if the weight is insufficient the best corrective is to see the mechanic and have the tension of the machine stiffened and so augment the weight by actually inserting more material.

The gauge of the article may quite easily be ascertained by counting the number of stitches round the circumference of the machine, thus a 144 needle machine will exhibit 144 stitches in the circumference of the stocking at its widest part. An examination of the system of shaping and seaming referred to will soon give a clue as to the method of manufacture employed. To ascertain the counts of yarn used, it is almost necessary to unravel the sample so as to obtain as long a length as possible to weigh on the scales. This is destructive to the stocking except where a skillful hand knitter may re-knit the length of yarn withdrawn and so re-establish it in its original integrity. The methods adopted for finding the counts of the yarn employed need not be here recounted as they now belong to the commonplaces of knit goods manufacture.

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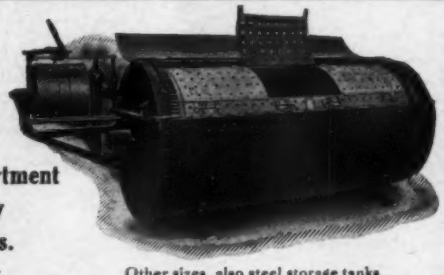

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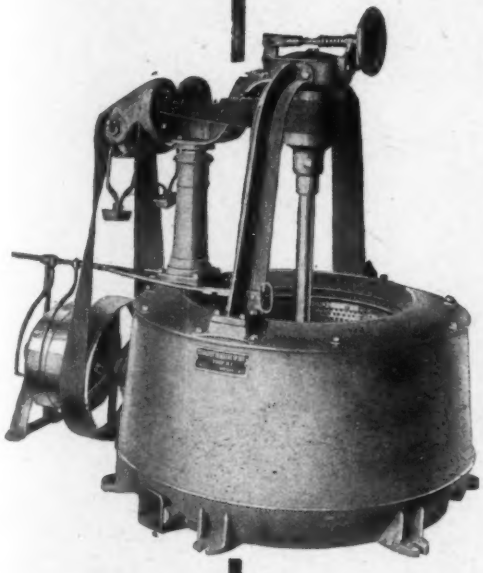

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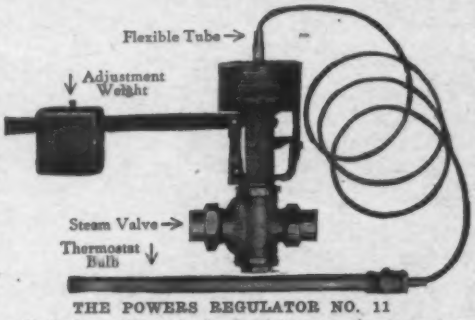

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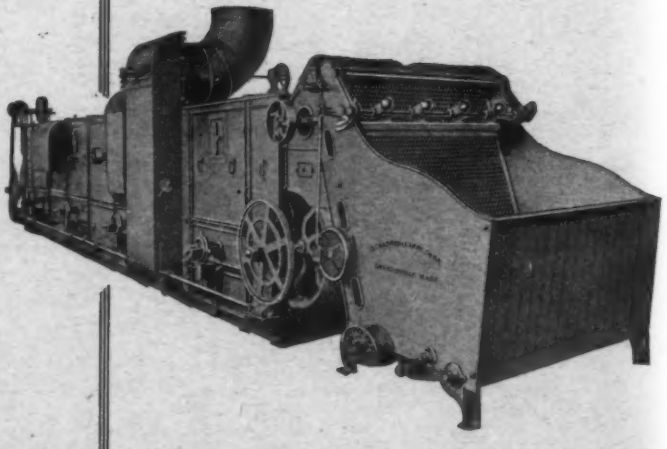

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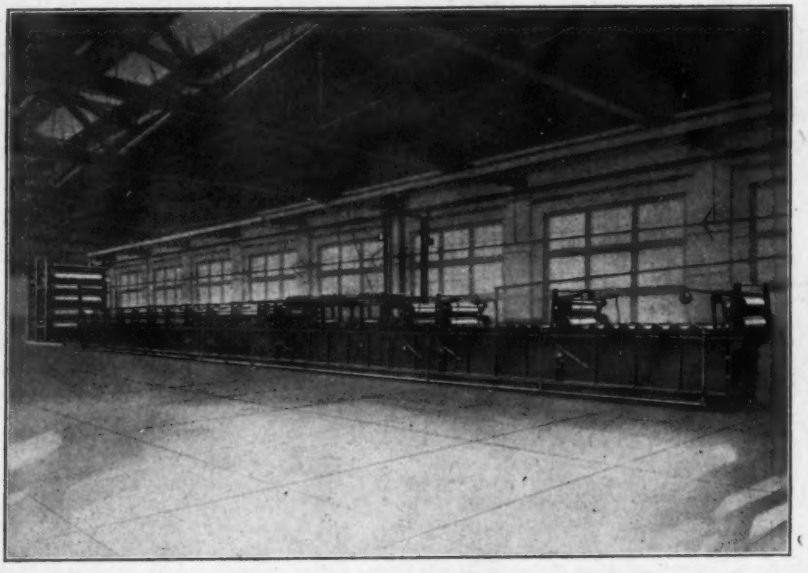

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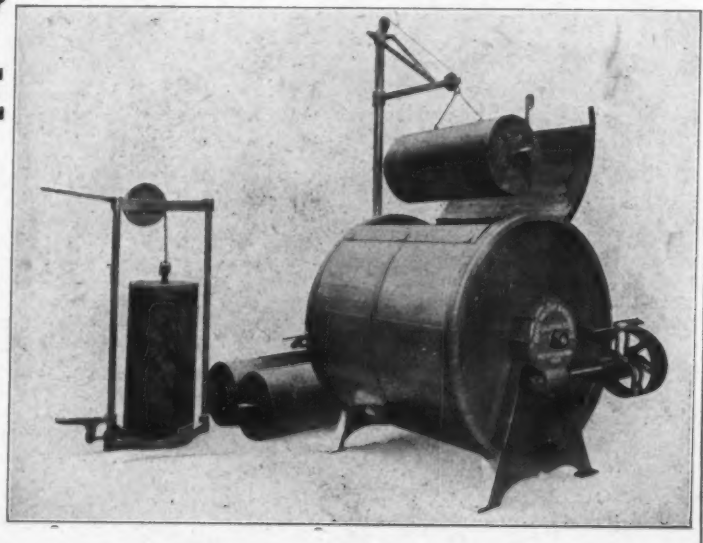

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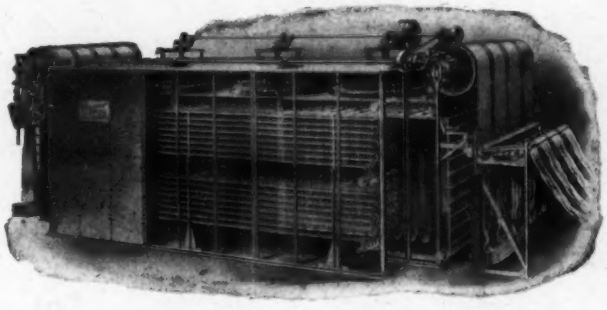

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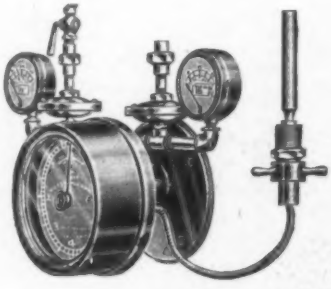

It's A Great Little Worker

The importance of sizing cannot be too strongly emphasized. Improper sizing frequently accounts for trouble in weaving that seems unaccountable.

It's a matter of temperature. Not any old heat, but a temperature evenly and constantly maintained at just the right point. A fluctuating temperature increases the cost of operation and reduces the value of product.

The TAG Perfect Temperature Controller will safeguard sizing, — will make it just right every time. It's a great little worker. It's automatic. You don't have to watch it.

Bulletin C-425 tells all about it.

C. J. TAGLIABUE MFG. CO.
TEMPERATURE ENGINEERS
18-88 Thirty-Third St. Brooklyn, N.Y.

Trade Mark
Reg. U. S. Pat. Off.

TEST COLOR FASTNESS BY RADIATION METHOD

The need for a basic standard brought the perfecting of this method of determining fastness to light of colors and dyestuffs.

The FADE-OMETER was designed solely to fill a need for a standardized light equal in intensity to sunlight and available at any period of the year.

Elimination of the old time sun testing method has brought about a revolution of vast import to the textile manufacturer who using the Fade-ometer standard, reproducible tests can now be made in a few hours.

Unequaled for comparative service. Write us for fuller information in regard to this instrument.

ATLAS
Electrical Devices
COMPANY
360 W. Superior Street
CHICAGO, ILLINOIS

RESULT OF QUALITY

Exhibitor Chemical Exposition New York Sept. 20-25

Our sales for July were the largest of any one month in the history of this Company.

Most of the thirty odd products we are selling showed an increase over previous months.

In the face of current business conditions, we doubt if this result could have been obtained if our products—dyes as well as intermediates — were not the accepted standard of their kind.

We are sincerely grateful to our customers for their liberal patronage.

Atlantic Dyestuff Company
WORKS: PORTSMOUTH and BURRAGE
MAIN OFFICE, BOSTON
NEW YORK PHILADELPHIA CHARLOTTE
CHICAGO PROVIDENCE

NOPOCASTOR—Is Best and Cheapest per Yard

National Oil Products Company
General Sales Office
220 Broadway
New York

NOPCO PRODUCTS

September 1920.

Too many mills ignore the importance of the "sulphonation value" of their Turkey Red Oils.

If it is important to use a sulphonated Castor Oil, then logically the degree of sulphonation is also if importance. This point, however, is rarely considered by the Textile Manufacturer.

NOPCOCASTER is unique in that it always has maximum sulphonation and goes further therefore, for each dollar spent than any other oil. It will pay you to investigate this claim. Let us help you standardize your raw materials by the NOPCO specification policy.

Send for samples and technical data on the uses of NOPCOCASTOR.

National Oil Products Co.

NATIONAL OIL PRODUCTS COMPANY

NEW YORK **CHICAGO**

Improve Your Blacks

"Developene"

Turns a *Rusty Black* to a *Lustrous One.*

THERE is no slight of hand connected with it. Send a pair of stockings, a skein of yarn or a sample of fabric, which has been dyed black, washed but not finished, to our Laboratory.

We will finish it with "Developene" and return to you. There will be such an improvement you will want "Developene" for your dye house right away.

MANUFACTURED ONLY BY

KALI MANUFACTURING CO.

1404-1410 N. Front Street

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PHILADELPHIA, PA.

Formaldehyde---Salicylic Acid Prevents Fermentation of Size

Sole Manufacturers of Hydroxy Oils and

Kali Chlorine Neutralizer—the Superior Anti-Chlor.

Largest Manufacturers in United States of

Basic Colors

As is well known, Basic Colors represent a group of dyestuffs indispensable to a number of industries, such as:

Cotton Manufacturing
Printing of Cotton Goods
Paper Manufacturing
Leather Manufacturing
Carbon Paper Manufacturing
Typewriter Ribbon Manufacturing
Printing Ink Manufacturing
Lake Manufacturing
Silk Dyeing
Cotton Printing

The types included in their manufacture represent such a variety as:

Du Pont Crystal Violet Powder
Du Pont Crystal Violet Base
Du Pont Methyl Violet NE
Du Pont Methylene Blue ZX (Zinc Salt)
Du Pont Methylene Blue B (Zinc Free)
Du Pont Victoria Blue BX and Conc.
Du Pont Victoria Blue B Base
Du Pont Victoria Green Small Crystals
Du Pont Victoria Green B Powder
Du Pont Auramine O and Conc.
Du Pant Chrysodine G (Yellowish)
Du Pont Chrysoidine R (Reddish)
Du Pont Rhodamine B and B Extra
Du Pont Basic Brown BXN (Reddish)
Du Pont Basic Brown GX (Yellowish)
Du Pont Nigeria Black BX and GX

and the closely related:

Du Pont Phloxine B
Du Pont Rose Bengal
Du Pont Erythrosine B

The completeness of this group of dyestuffs will easily be recognized as of utmost importance to many industries. The purity of shade and strength represent the best that can be produced. The standardization is given the most careful attention.

Do not fail to see our unique display at Sixth National Exposition of Chemical Industries, Grand Central Palace, New York, week of September 20th. You are cordially invited to make our booths, 7 and 8, your headquarters.

E. I. DU PONT DE NEMOURS & COMPANY, Inc.

Dyestuffs Sales Department

WILMINGTON, DELAWARE

Branch Offices:

New York **Boston** **Providence** **Philadelphia**
Chicago **Charlotte, N. C.**

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National Aniline and Chemical Co., Inc.

OFFERS FOR PROMPT SHIPMENT

ANILINE OIL

ANILINE SALT

META TOLUYLENE DIAMINE

General Offices 21 Burling Slip, New York

ESTABLISHED 1815

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CHARLOTTE, N. C.

Importers and Manufacturers of

STARCHES, GUMS, DEXTRINE, ALIZARINE ASSISTANT, SOLUBLE OIL, SOAP

And Every Known Material from Every Part of the World for Starching, Softening, Weighting and Finishing Yarn, Thread or any Fabric.

Special Attention Given by Practical Men to Specialties for

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Cotton, Woolen and Worsted Fabrics combining the latest European and American Methods.
We believe there is No Problem in

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That We Cannot Solve.

FORMULAS for the best method of obtaining any DESIRED FINISH on any fabric cheerfully given.

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A Complete Line

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Consolidated Color and Chemical Co.
AND
Central Dyestuff & Chemical Co.

NEWARK, N. J.

OFFERED BY

H. A. METZ & COMPANY

122 HUDSON ST., NEW YORK

BRANCH OFFICES AT

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"BRETON"
MINEROL "F"

For Cotton Yarns

"It stays on the Yarn"

BORNE, SCRYMSER COMPANY

80 South Street, NEW YORK

BOSTON **PHILADELPHIA**

Works: Elizabethport, N. J.

Mercerizing Gassing Bleaching

We have a new and strictly modern plant for mercerizing, gassing and bleaching.

Located as we are in the center of the combed yarn spinning industry of the South, we are enabled to furnish you with the highest quality processed yarns in all numbers.

The American Processing Company

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Fast Vat Dyes

Made by

THE SOCIETY OF CHEMICAL INDUSTRY IN BASLE, SWITZERLAND

SOLD IN AMERICA

during the whole period of the war by

A. KLIPSTEIN & COMPANY, New York

and obtainable now in rapidly increasing quantities.

These Dyes are Faster than Indigo

They are sold under the registered trade marks of

"CIBA" and "CIBANONE" DYES

and include every necessary shade of color. For example—
"CIBA" Blue, Violet, Red, Scarlet and Bordeaux
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The Textile trade of America
need not suffer for the lack of

FAST VAT DYES

Quotations and samples on application

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The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

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For All Purposes

All Sizing and Finishing Products for Cotton

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Manufacturing Chemists

Specializing in
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DYEING
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AND
FINISHING
TEXTILES

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EAGLE FINISHING

400 MILL 500 MILL

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BLUE RIVER CRYSTAL

These STARCHES are manufactured by carefully controlled and standardized methods.

PURITY and UNIFORMITY are secured by accurate laboratory tests.

ECONOMY and EFFICIENCY are proven by the constantly increasing number of exacting cotton manufacturers who are getting satisfactory results by using our STARCHES especially selected for their conditions.

Recommendations are based upon intelligent investigation of each individual problem.

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500-540 Pear Street, Reading, Pa.

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AMERICAN MADE DYESTUFFS

ACCO DIRECT GARNET

Easily soluble. Level dyeing.

The Grasselli Chemical Co.

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SULPHUR COLORS: Black, Blue, Brown, Green.
Direct Cotton Colors, Acid and Chrome Colors

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Bichromate of Soda Sodium Sulphide
Zinc Dust, Chemicals and Acids

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Sole Selling Agents for Essex Aniline Works, Inc., Boston, Mass.

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Midland Blue R

Midland Vat Blue 5 B

Are Vat Blues of special interest to all manufacturers of fast color Ginghams and Chambrays—of good fastness to washing, chlorine and light—suitable for both raw stock and yarn dyeing. For the same trade we also have some new sulfur colors of extreme brilliancy.

Aniline Dyes and Chemicals, Inc.

Cedar and Washington Streets **New York**

SURPASS CHEMICAL CO. INC. FOR USE IN AUTOGYP PROCESS OF DYEING. AUTOGYP PATENTED IN U.S.A. SEP. 26, 1916 IN CANADA OCT. 10, 1916 ALBANY N.Y.

WHY BLEACH?

Bleaching cotton goods is no longer necessary, and if you are continuing your old bleaching processes you are only wasting money.

Forget about the bleaching process. Use the AUTO-GYP Process of Dyeing which simultaneously does to shade and at the same time eliminates all specks, motes, leaf and shives.

The old methods took approximately 15 hours while the AUTO-GYP Process requires three hours' time, and also preserves tensile strength, saves shrinkage, steam, labor, water and all chemicals used in bleaching processes.

Let us prove our claims to you at OUR expense. Write today for full information.

SURPASS CHEMICAL CO., Albany, N. Y.

Sole Agents for the South
The Color Service Corporation
534 Canal St., New York

Represented in the South by
A. S. Roberts
215 E. North St., Greenville, S. C.

AUTO GYP
Process of Dyeing

Rubber Covered Rolls

Do You Know

That to compare our Rubber Rolls with other makes means that you will

BUY FROM US?

Reason

We make one quality only—THE BEST —and the best is what you want.

WE ARE RUBBER ROLL SPECIALISTS

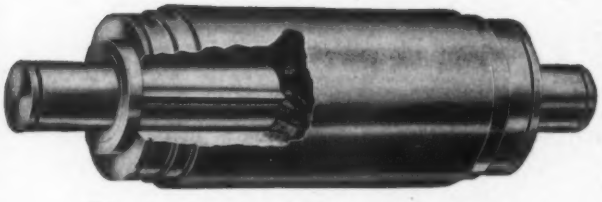
If a complete roll is required we can make and guarantee same.

Are you losing liquor from your dye tubs? If so try our Rubber Plugs with brass leaders and save your liquors.

The American Wringer Co.

DEPT. F WOONSOCKER, R. I.

PERKINS
Patented SPLINED CALENDER ROLLS



Their Superiority Is Due To Unique Advantages!

When you purchase a Perkins Roll, you do so with a feeling that you are getting the best that can be bought, not only in manufacturing quality—for they are the result of 30 years' experience—but in unique features that can be found only in the Perkins.

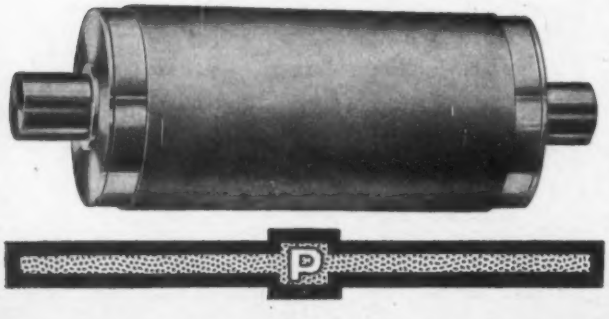
All are fitted with the Perkins Patented Spine which prevents slipping or turning on shaft. Let us tell you all about the advantages of the Perkins and what other well known finishers are gaining from their use.

Every Perkins Roll is guaranteed. Your old rolls can be refilled to gain special advantages of the Perkins.

The line includes Paper Rolls, Husk Rolls, Cotton Rolls and Combination Cotton and Husk Rolls for Calenders, Mangles, Schreiner Machine and General Finishing Work.

Write today for information and prices.

B. F. PERKINS & SON, Inc.
HOLYOKE, MASS.



Stop Leaks in The Labor-Cost

Falling markets only emphasize the need of economy in manufacturing; getting more for the money you pay operatives.

With Veeder Counters on machines you will get a reduced manufacturing cost as regards labor, for each operative will attend to a larger share of production.

No measuring, weighing or hand-counting the product; the work registers as the worker *produces* —on machines equipped with

Veeder COUNTERS

Loom Pick Counter

This is a much-reduced view of the new Loom Pick Counter, built larger than former models —more size to the figure-wheels, more legible readings—with the added endurance of a heavier number-mechanism. Intended to be driven from the crankshaft, and registers the output in hundreds or thousands of picks, as ordered. Reads in plain figures; there's no mistaking the count; no disputes. *Textile Counter booklet describes this and other counters built exclusively for textile machinery.* Copy free.

The Veeder Mfg. Co.
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THE BALL-BEARING PRINCIPLE IS FUNDAMENTAL

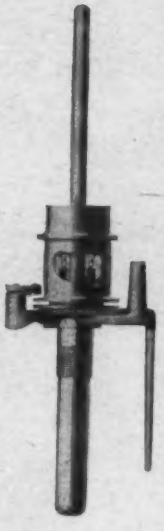
Save Power — *Increase Production*

USE

Allen Ball-Bearing Twister Spindles

A NEW SOURCE OF SPINDLE SERVICE

Ball Bearing Twister Spindles are not an innovation; many thousands are now in successful use. No departure is made from standard spindle practise, thereby satisfaction is guaranteed. Our Ball Bearing Spindles interchange with any present type spindles. Kindly forward a sample of your Twister Spindles for our quotation and delivery date.



ALLEN SPINDLE CORPORATION

80 BOYLSTON ST.

BOSTON, MASSACHUSETTS

ELLIOTT A. ALLEN, President.

FIG.20.

All our Baskets made from Lane Duck of our own weaving. By use of strictly long staple cotton and approved modern methods, unusually high tensile strength and wearing qualities are obtained.

LANE CANVAS MILL BOXEE AND TRUCKS

FIG.27

This Truck embodies all the advantages of Lane Baskets, plus our special designed Thread-guard Casters, which are, in fact, non-clogging. Furnished in either stationary or swivel frame style of generous diameter and tread.

Standard American Equipment

W. T. LANE & BROTHER

Manufacturers

Poughkeepsie :: :: **New York**

Leatheroid
MILL RECEPTACLES

The Truly Permanent Fibre Cars

Leatheroid No. 3 All Fibre Car. Solidly Built. All wearing surface protected.

Leatheroid cars, as all Leatheroid receptacles, are made of "Leatheroid"—the most durable and toughest, smooth fibre known, and the other parts are chosen with care, and put together right.

Leatheroid Cars stand the heaviest loads and roughest usage day after day, year after year, and then show very little effects of wear.

Leatheroid Cars, Roving Cans, Boxes, Baskets, etc., are made in all sizes and shapes.

Sold by Leading Southern Mill Supply Houses.

Rogers Fibre Company
Leatheroid Sales Division
1024 Filbert Street, Philadelphia

Leatheroid No. 2 Steel-Clad Car. Nothing Equals it for Construction, Finish and Serviceability.

Receptacles

THAT SERVE YOU BEST

Diamond Fibre Receptacles are an efficient and economical transportation system. They are made of Diamond Fibre, which is tough as horn and almost as hard as iron, yet lighter than aluminum. This material does not dent, crack, break, or splinter. A superior material and superior construction provide an unusual combination of great strength and durability with light weight and convenience.

Your product is protected when handled in these receptacles, because the interior construction is smooth and flawless. For example, Diamond Fibre Seamless Roving Cans are in great demand by mills because there is not a seam or projection to catch a particle of the contents. Furthermore, the close texture and glossy surface of the fibre Receptacles preserve their fine appearance under the hardest usage because the color is **in-built** and the surface does not chip, nick, or wear off.

There is a Diamond Fibre Receptacle for every mill need. Our roving cans, mill boxes, and baskets, doffing cars, gill cans, trucks, barrels, etc., are leaders in their respective fields. Standard sizes and designs, or made to any specifications. Write us your requirements and let us co-operate.

We maintain an office in Greenville, S. C., to serve the Southern mills.

Send for Special Catalogue.

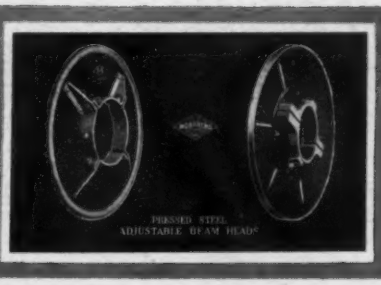
Diamond State Fibre Company

Dept. WZ

BRIDGEPORT, PA., (Near Philadelphia)

In Canada, Diamond State Fibre Co.

of Canada, Ltd., Toronto.



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STEEL REELS, BEAMS AND SPOOLS

BEAMS, Spools and Reels made of Pressed Steel are decidedly superior to those made of wood or cast-iron. They are stronger and lighter.

Mossberg Pressed Steel Construction is being utilized by mills the country over. Mossberg Equipment is saving time and money wasted by frequent changing and purchasing.

Write for interesting catalog on Pressed Steel Equipment. It is instructive and valuable.

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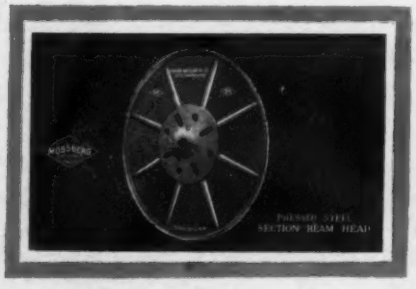
President and General Manager

FRANK T. CHASE
Treasurer and Sales Manager

EVERETT L. FORD
Secretary and Superintendent



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WRENCHSMITHS FOR 20 YEARS

ATTLEBORO MASSACHUSETTS

Nickle-Plated Drop Wires

—IN ANY SIZE OR STYLE AT ONLY—

25c Per Thousand

above the price for regular finish. Our drop-wires are made of the best grade steel wire.

STEEL HEDDLE MANUFACTURING CO.

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Southern Office, Hampton Smith, Mgr., 111 Washington Street, Greenville, S. C.

S. S. & F. Co., Inc.

CHARLOTTE, N. C.

The S. stands for Southern, the S. & F. for Safety First

The only Flyer Presser Manufacturers in the South. Does your machinery need OVERHAULING? Does your Steel Rolls, Flyers, Spindles, etc., need REPAIRING? Are you NEEDING Flyers, Flyer PRESSERS, Rings of any kind, Guide Wires or any other supplies? If so, this is YOUR BUSINESS — OUR BUSINESS IS SUPPLYING these needs.

Southern Spindle & Flyer Co., Inc.

CHARLOTTE, N. C.

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W. H. HUTCHINS, - Vice-Pres. and Sec.

The Palmer Adjustable Thread Guide

For Ring Spinning and Twisting Frames

Easily adjusted.

Extreme accuracy and permanence of setting.

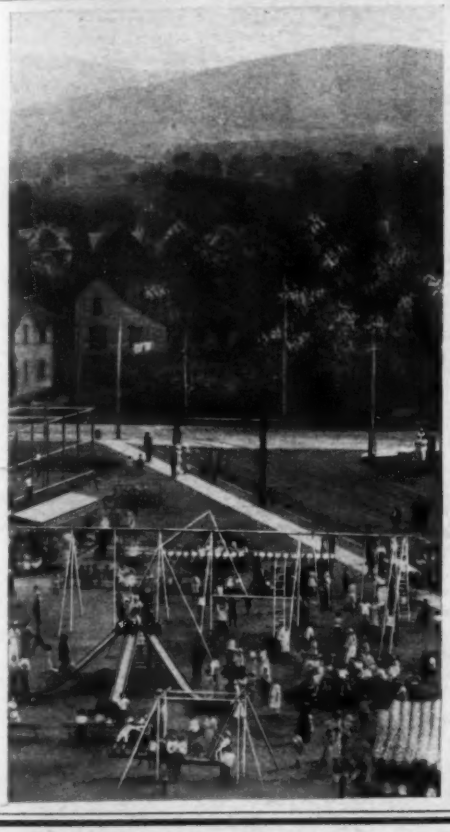
Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut



For the Happy Children of Contented Parents

When you provide happiness and enjoyment for the children of your employees it can be nothing else than a certain indication that you really have their interest at heart. Install Medart Playground Equipment in your community—watch the enjoyment it brings to the children—and, watch the increased contentment among your workers when they know that you are something more than just "the boss."

MEDART
PLAYGROUND EQUIPMENT

For 50 years the Medart Company has been manufacturing and perfecting gymnasium apparatus for vigorous men—an experience that has especially fitted it for the leadership it has always maintained in the development of playground equipment best suited to promote those bodily and mental qualities which mold today's childhood into tomorrow's man- and womanhood.

Catalog "L" fully describes Medart Playground, Swimming Pool, Gymnasium and Locker Room Equipment. Contains valuable suggestions for playground installations. It will be sent gladly to anyone requesting it.

Fred Medart Manufacturing Co.

Potomac & DeKalb Sts. St. Louis, Mo.
Gordon Lewis, District Manager, Walton Bldg., Atlanta, Ga.

STYLE K MIDGET ORCHESTRION

One of our small styles that is especially attractive where a small instrument is desired.

SEEBURG

Self Playing Musical Instruments are wonderful entertainers.

For Your

Recreation Rooms, Cafeterias, Motion Picture Theatres

Simplicity—Reliability—Service

Scofield Auto-Music Company

CHARLOTTE, N. C.

Special agents for the Southeast.

Accurate Under High Speeds

"UNIVERSAL" COUNTERS

under the most exacting tests, have proved accurate and dependable under high speeds and strenuous service that made other counters fall to pieces.

Its accuracy and dependability is due to its simplicity and its strength. Steel construction makes for strength. Simple in design no ratchets, just a toolsteel finger and driving head, which moves the pinion and this moves the number wheel one count when the pinion locks in position until it is moved by the finger on the driving head. Impossible to count more than once in each operation. Its driving lever may be drawn around to ⅞ inch of a revolution, and released and number will return to starting point.

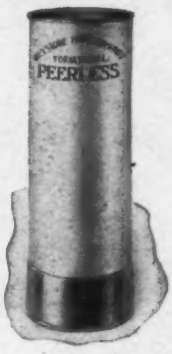
The "UNIVERSAL" Counter lives up to its name. It may be used anywhere a counter is needed as a stroke counter or a revolution counter. Fool proof, error proof, wheels interchangeable — simplicity itself.

Made in three types, outside reset, inside reset, and non reset.

Write for further information.

Precision Machine Co., Inc.

172 Second St. Milwaukee, Wis.



No waste weight.
Minimum of bulk.
Maximum of strength.

KEYSTONE "PEERLESS" SEAMLESS ROVING CANS

Made of Keystone Fibre, the lightest and strongest fibre made.

While giving longest service, "Peerless" cans never lose their good appearance.

No bolts, rivets, or seams, no rough edges to catch or tear.

Our booklet shows full line of Keystone Holloware for mills. Write for it.

Your mill supply house can fill your order.

Keystone Fibre Company

Box 141-C Yorklyn, Delaware

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Philadelphia Office: 504 North American Street.
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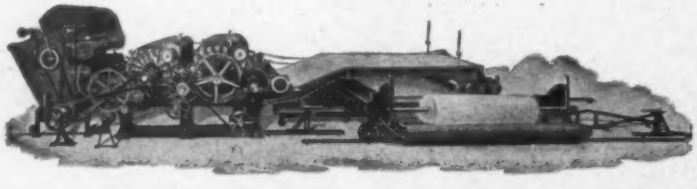
SMITH & FURBUSH MACHINE CO., Philadelphia

Specialists in machinery for working all kinds of waste products. Machinery for coarse waste yarns, mop yarns, rope; for shoddies, for wiping waste; for re-woven jute bagging, etc.



FELTING OUTFITS

for making batts or felts for mattresses or comfortables.

We build complete outfits of machinery for all kinds of felts.

Send for Catalog S-15

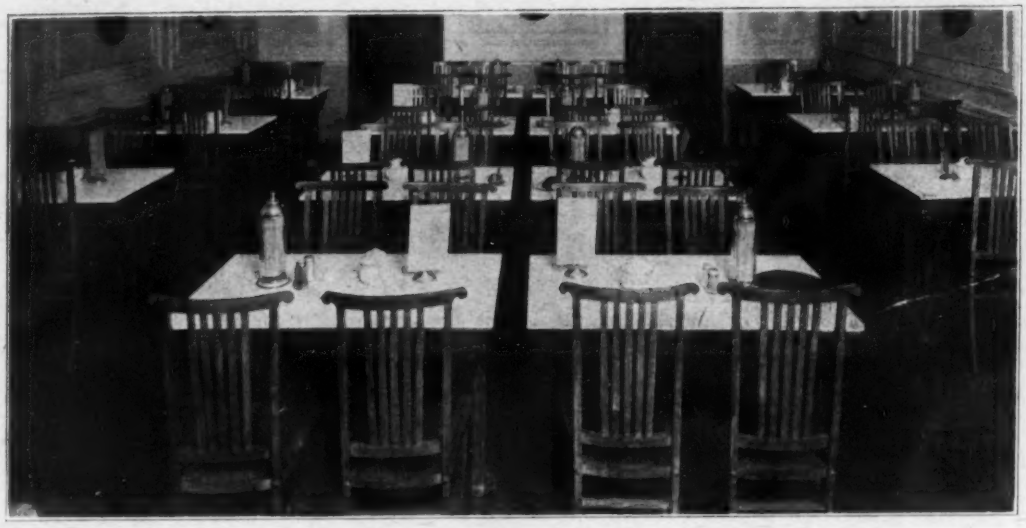
SPOOLS

Let us submit prices and samples on WARPER and TWISTER SPOOLS. Plain wooden head and metal shield. A list of Southern Mills using spools given on request.

Greenville Spool & Mfg. Company

Greenville, S. C.

THE WRIGHT EQUIPMENT
For Your Mill or Factory



A CLEAN SANITARY DINING ROOM

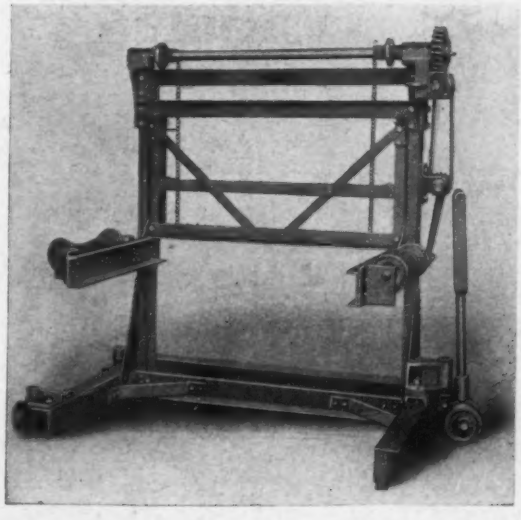
We build special equipment for your cafeteria, kitchen and dining room complete in every detail. Shipments made promptly. Write for information how to increase your production.

THE WRIGHT COMPANY, Inc. 185 Peachtree St., Atlanta, Ga.

IMPORTERS—JOBBERS

Hotel, Restaurant and Institution Equipment

THE WRIGHT GOODS THE WRIGHT PRICE THE WRIGHT SERVICE



One Man Handles All Beams

Our portable elevators have many applications and serve many purposes around the mill. The design shown above is saving time and labor for mills, as with it one man can handle the heavy warp beams, move them about from place to place and set them in position on the looms.

Without obligation, one of our representatives will gladly call on you and tell you frankly what our equipment can do for you.

REPRESENTATIVES FOR

Economy Engineering Co., Tiering Machines.
Automatic Transportation Co., Storage Battery Trucks.
Barrett-Cravens Co., Lifting Platform Trucks.
Standard Conveyor Co., Conveying Systems.
Berger Mfg. Co., Steel Lockers and Bins.

"SERVING SOUTHERN CONCERNS"

J. D. COLLINS Ninth Floor Grant Bldg. **ATLANTA, GA.**

PEACE OF MIND

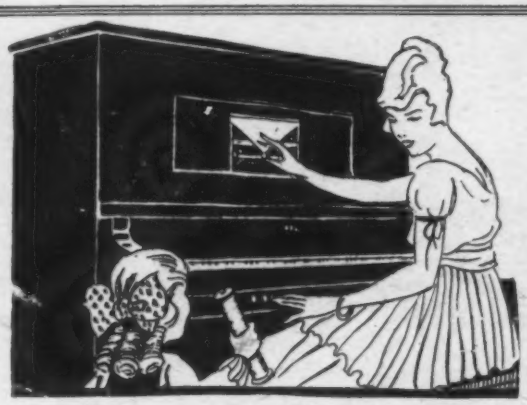
Peace of mind is worth something, isn't it?

Any man will feel that his mill is more safe if he knows the watchman is being held to his duty. That is just what

ECO WATCHMAN'S CLOCKS

will do. They keep an "EYE" on the watchman.

ECO CLOCK COMPANY
196 Congress St., Boston, Mass.
24 Cortlandt St., New York
Southern Department: 23 Walton Bldg., Atlanta, Ga.



ENJOYABLE EVENINGS
are always the rule in
the home where the
STIEFF PLAYER PIANO
Holds Sway

Our "Play While You Pay" plan is an easy, pleasant way to purchase. Write us about it. Investigate our Reproducing player; electrically driven. The player with a human touch.

CHAS. M. STIEFF, INC.
Established 1842. M. D. MANNING, Mgr.
Charlotte's Musical Headquarters.
219 South Tryon, Charlotte, N. C.

FIFTY-FIFTY

More Playgrounds —— More Efficiency

More than 300 Cotton Mills and Factories have already solved their labor and production problems by installing

THE FUN FUL LINE
PLAYGROUND EQUIPMENT

Because it is an investment that benefits employees and employers equally.

"Think It Over"

"Everything for the playground"

Send for new Catalog No. 5. It is free.

HILL-STANDARD CO.

SALES OFFICE
CONWAY BUILDING
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Ed. W. Ferger,
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Representative
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FACTORIES:
ANDERSON, IND.
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The VERTICO-SLANT

The Perfect Drinking Fountain

The vertical stream fountain has been proven a disease spreading menace because the water falls back into the fountain germ-laden from the drinker's mouth to be carried to the mouth of the next drinker.

"VERTICO SLANT" STREAM FOUNTAINS

Built on scientific principles, these fountains are absolutely sanitary. The slight slant in their stream prevents any water returning to nozzle after the water has reached the lips; the nozzle itself is buried so lips cannot touch it

Let Us Tell You. Write for our new 74-page catalog.

RUNDLE-SPENCE MFG. CO.
MILWAUKEE WIS.

AMERICAN
SUPPLY COMPANY
PROVIDENCE, R. I.

MANUFACTURERS OF

Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping,
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity. None too small to receive careful attention.

We Are Specialists In

Cafeteria Equipment

With particular reference to the needs of textile establishments.

Your whole order, from salt cellars to steam tables, can be placed with us with the assurance it will be handled quickly and right. Our experience in this line insures an intelligent appreciation of your needs, while the immense stock we carry in our Chattanooga warehouse, within a few hours' freight haul from your establishment, is a guarantee of speed in meeting your requirements, an especially valuable consideration in replacing broken dishes and glassware.

Prices will be found uniformly better than you may expect elsewhere, and the quality of every article is unsurpassed.

Won't you let us figure with you on your requirements? Our advice will be found extremely helpful in determining what will serve you best.

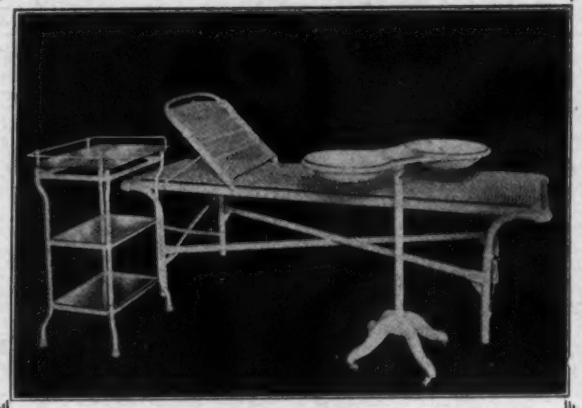
Chattanooga Queensware Company

CHATTANOOGA, TENNESSEE.

Specialists in Hotel and Cafeteria Equipment.

F. H. Thomas Co.

Boston, Mass.



A First Aid Room or an Emergency Hospital For Your Employers will

Decrease your liability for industrial accidents.

Decrease time lost through temporary incapacity of your workers.

Decrease needless suffering from minor injuries and prevent minor injuries from developing into serious cases.

Increase morale and loyalty among your employees and give you opportunity to show your interest in the welfare of your workers.

The F. H. Thomas Company has equipped First Aid Rooms for over four hundred factories and mills, who have appreciated these facts, including the following Southern mills:

WINSBORO MILLS Winsboro, S. C. **WATEREE MILLS** Camden, S. C. **WHITNEY MILLS** Whitney, S. C.

A modern Thomas equipped emergency room will put you also among the progressive owners who are saving money and advancing the conditions of their workers.

Write for information and advice, stating, if possible, the number and nature of your accidents. Southern Representative.

F. H. Thomas Co.

689-691 Boylston St.

Boston. Mass.

THIS

CONVINCING COMPARISON

SHOWS THE SUPERIORITY OF

SIGNODE SYSTEM

OVER THE USUAL BALE TIE.

LET US SEND YOU FULL DETAILS

SIGNODE SYSTEM, INC.

CHICAGO ATLANTA

Boston New York Philadelphia San Francisco Toronto

5/8" x .015 SIGNODE TIE	COSTS 12 % LESS PER FOOT	HOLDS UNDER 800 LBS. PULL	NO "SPIDER" TO INJURE HANDS
Compared with			
USUAL 5/8" x .017 BALE TIE	COSTS 12 % MORE PER FOOT	BREAKS UNDER 500 LBS. PULL	DANGEROUS "SPIDER" OFTEN PRESENT

Cypress Tanks
Wooden Packing Cases

ALL STYLES

Manufactured From

GEORGIA PINE POPLAR CYPRESS

WHITE PINE and GUM

Your Inquiry Solicited

Hightower Box & Tank Co.

Corner Humphreys and Glenn Streets,

Box 1025 ATLANTA, GA.

Acme No. 9 Bale Buckle

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ACME

Cold Rolled Bale Ties

with

Acme Bale Buckles

or

Acme Seals

Acme Steel Goods Co., Mfrs.

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Acme Nailless Strapping with Seal applied

SILICATE OF SODA

SEAL BRAND Liquid Mineral Glue

A PERFECTED adhesive specially prepared for quickly and securely sealing corrugated or fiber shipping cases.

Convenient to handle, easy to apply, quick in setting, economical in cost.

It makes your packages very secure, and thus aids in giving your customers complete satisfaction.

Get the best results in your shipping department. Use only "*Seal Brand Liquid Mineral Glue.*

J. R. REGNAS & CO.

10-14 Tift Street Atlanta, Ga.

Shipments from

Atlanta, Ga.; Chester, Pa.; Buffalo, N. Y.; Kansas City, Kans.; Anderson, Ind.

White Hickory
BUILT ON HONOR

Judge Them By The Miles of Service

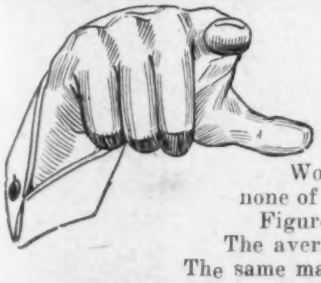
Miles of Service are assured by these Units.
Continental Red Seal Motor, Eiseman High Tension Magneto, Sheldon or Timken Worm Drive Axles, Timken Bearings and all other units of highest standard grade.

The initial cost of a motor truck is only a percentage of the total transportation cost. It is *Miles of Service* that count.

You can rely on White Hickory Trucks. They stand up under adverse conditions—they give miles of service at an extremely low hauling cost, with any kind of a load, on every kind of road.

Back of the White Hickory Truck is the forty year record of the White Hickory Wagon.

White Hickory Motor Corporation
Atlanta, Georgia, U. S. A.



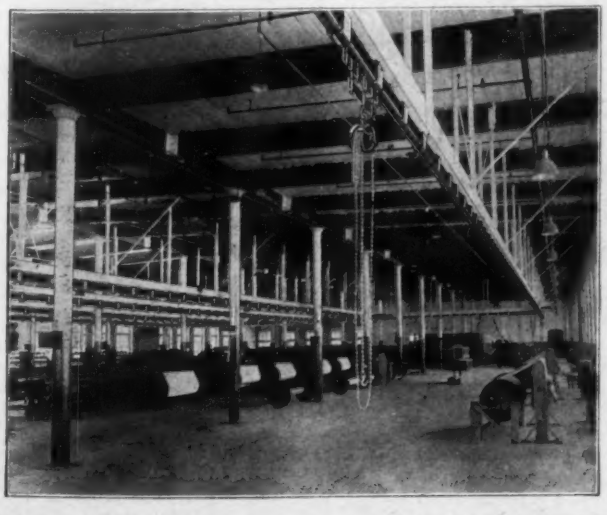
CAN YOU AFFORD "OVER-WAY" FOR "TRUCKING" IN YOUR PLANT?

Indeed you're losing money—actually, if you do not use "OveR-Way" Conveying Equipment.

Worse than that, you're paying for "OveR-Way" equipment and getting none of its benefits.

Figure it out for yourself.

The average man can convey on a wheelbarrow or shop truck 200 to 500 pounds. The same man can handle up to 8,000 pounds with less effort by using



OVERWAY

Monorail Conveying Equipment

The majority of equipments we have installed saved in labor alone their cost in from six to twenty-four months.

Our engineering department is maintained for the express purpose of designing special, or adapting standard equipments to suit requirements for the economical handling of your loads.

Write for particular information, which we will be glad to furnish without obligation.

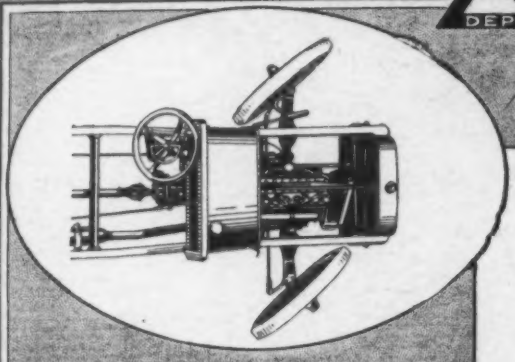
Richards-Wilcox Mfg. Co.
"A Hanger for any Door that Slides"
CHICAGO ST. LOUIS LOS ANGELES PHILADELPHIA — AURORA, ILLINOIS, U.S.A. — LONDON, ONT. — BOSTON NEW YORK MINNEAPOLIS SAN FRANCISCO

TRI-ANGLE

POWER SERVICE MOTOR TRUCK DEPENDABILITY

A Three-Fold Value

¾ · 1½ · 2 Special & 2½ Ton Models



SHORT TURNING RADIUS

The TRIANGLE steering gear is placed *far forward on the chassis.* This means that the drag-link, or rod connecting the steering column with the steering arm, is very *short.*

In most trucks this drag-link is long, and the front wheels can only turn until the tires *approach* the "link."

In TRIANGLE Trucks the front tire and rim pass *behind* the "link." Hence their extremely short turning radius—23 ft. 9 in. for the 1½-ton size.

The frame narrows at the forward end, which helps in short turning.

For catalogue and full information, address or wire. Dept. Z.

Eastern Representatives
TRIANGLE MOTOR SALES CO.
381 Fourth Ave. New York City

New England Distributors
Eugene F. Lally and Sons Co.
Boston, Mass.

TRIANGLE MOTOR TRUCK COMPANY
St. Johns, Michigan

Acme DOORLESS Baler
Patents Pending

A 600-lb. bale of **Cotton Waste** measures 60 x 22 x 22 when compressed in the **Acme** Doorless Baler. Consider the large saving in storage room and the greater quantity you can load in cars. Built in numerous sizes and pressure capacities.

Galland-Henning Mfg. Company
MILWAUKEE, WIS.
SOUTHERN SALES REPRESENTATIVE:
THE LOVINGOOD COMPANY, Atlanta, Ga.

THE HURST COMPANY
208 Austell Bldg.
Atlanta, Ga.

We Manufacture

Paints that are Specially Adapted to the South Country.

Best Roof Paint,
Best Rubber Roofing Paint, and
Best Bridge and Metal Paints.

SATISFACTION GUARANTEED.

Also Rubber and Slate Surfaced Roofing.

Make your inquiries to us.

Prices Cheerfully Quoted.

Stewart Silk Co. Mill, Easton, Penn. Top floor, showing concrete saw-tooth roof. Concrete columns nine inches octagonal.

Built for Less Than Estimated Cost

THOMPSON & BINGER turned the Stewart Silk Company's new mill over to its owners for less than estimated cost. This building was designed and built by us on the cost-plus basis.

We recommend the cost-plus contract because it is mutually advantageous. We also recommend that we be retained to design buildings to be constructed by us. Unbiased consideration, based upon experience, suggests that the designing of a concrete building should be done by the organization appointed to do the actual construction, and that the entire achievement be consummated on the cost-plus basis, under a single contract.

5 **At present we are constructing buildings in five states.**

THOMPSON & BINGER

INC.

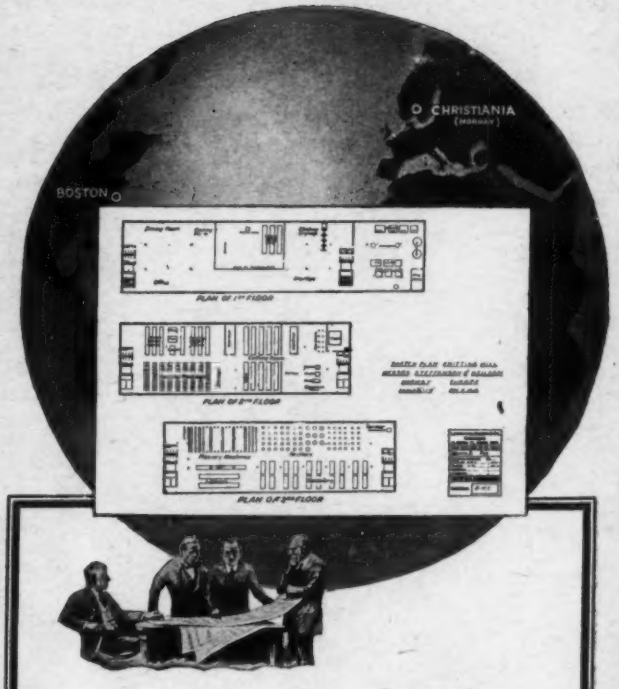
ENGINEERS & CONTRACTORS

CONSULTATION - DESIGN - CONSTRUCTION

NEW YORK
280 MADISON AVE.

SYRACUSE
GURNEY BUILDING

CONCRETE



When age threatens the efficiency of your mill

BUILDING WITH FORESIGHT

MANY old mills still have splendid possibilities. The skill of the engineer often opens the way to full effectiveness. Modernizing a mill presents a many sided problem, to be solved only by broad technical experience, ingenuity and close study.

Lockwood, Greene & Co., Engineers, were recently called upon to recommend machinery layout for a certain knitting mill near Christiania, Norway. Although the plant had been in operation for several generations, our investigation disclosed that a new layout, an improved power plant and additional machinery would make the mill efficient once more.

No plant will hold an important place indefinitely in competition *unless improvements keep it modern.* At home and abroad, we bring a world-wide textile experience to the problems of mill construction.

LOCKWOOD, GREENE & CO.

ENGINEERS

EXECUTIVE OFFICE, 60 Federal Street, BOSTON

ATLANTA CHICAGO NEW YORK DETROIT
CLEVELAND CHARLOTTE PHILADELPHIA

LOCKWOOD, GREENE & CO. OF CANADA, LIMITED
285 Beaver Hall Hill, MONTREAL

COMPAGNIE LOCKWOOD GREENE, 47, Avenue de l'Opéra, PARIS, FRANCE

A 1-16 inch coat will put any old roof in a weather-proof, better-than-new condition.

(*Registered U. S. Patent Office*)

GILSO-CEMENT is a combination of ingredients proven after years of actual service to be the most perfect water and weather resisting material for the renewing of old roofing or for the coating of exposed structural surfaces.

This perfect roofing material has been standardized by practically every railroad in the United States for old roof renewing purposes. This proves that it has all the qualities necessary for making a new roof of an old base.

GILSO-CEMENT is about five times thicker than paint—a combination of the best preservatives together with asbestos fibre and oils. One coat the thickness of 1/16 inch will cover the old roof, thoroughly sealing up every crack and crevice, nail holes and breaks, forming a tough one-piece covering which is water-tight, weather proof, and will withstand the elements regardless of how severe and under all conditions will remain tough and elastic, absorbing all contraction and expansion. Its non-drying oils thoroughly saturate the old base, thus preventing decay, completing its qualifications for making a new roof of an old base.

GILSO-CEMENT can be applied to any roofing, whether gravel, composition, tin or iron, regardless of the conditions of the roof. One coat will place it in a better-than-new condition.

GILSO-CEMENT will prove a good investment for coating a new composition roof, as it will protect the felt from the elements, prevent cracking, and makes expense for frequent painting or roofing repairs unnecessary.

GILSO-CEMENT is highly recommended by engineers for painting structural iron work on bridges water towers, smoke-stacks, etc., owing to its not being affected by acids or gases. It protects and preserves the metal surface better than any other material known.

Let us quote prices. Testimonials furnished upon request. Write us today.

The High Grade Manufacturing Company

Cleveland, Ohio

"Hampden *SUNRAY* Mill White Oil Paint Makes the Sun as Eager To Get in As the Workers Are To Get Out."

SUNSHINY days make workers chafe at restraint. Consequently—production suffers.

Why not bring the outdoors indoors—let the sunshine in and cure restlessness.

That is what Hampden *Sunray* Mill White Oil Paint will do. It fills the need for a good paint, which is needed anyway, and in addition provides a smooth, longlived surface that diffuses an unusually high percentage of light because of its extra purity and whiteness. It's washable too.

Send for particulars of Hampden Sunray Mill White users in the Textile Industry.

Deliveries from the Factory or from Local Dealers

HAMPDEN PAINT & CHEMICAL CO.

Makers of Good Paint for over 68 years.

Division E, Springfield Massachusetts

Kaustine

Sanitary Sewage Disposal Systems

Better Morale in *Your* Mill Village

THE better class of workmen *seek* the ordinary conveniences and comforts of home life, which you *demand* for yourself. They know that their productive power and earning capacity are dependent upon their physical condition as well as upon their mental state.

Kaustine Sanitary Equipment installed in mill homes provides the comfort and refinement essential to healthy, contented inhabitants of unsewered mill villages.

It is complete and scientific in every respect—endorsed by health boards everywhere, because of the thorough and adequate manner in which it disposes of fecal matter immediately after discharge from the body. It affords the convenience of a city water toilet.

To insure an ample supply of reliable labor, every mill village in an unsewered area should be equipped with a Kaustine Chemical System, or Hydro Kaustine Septic Tanks. It is welfare work that returns big dividends.

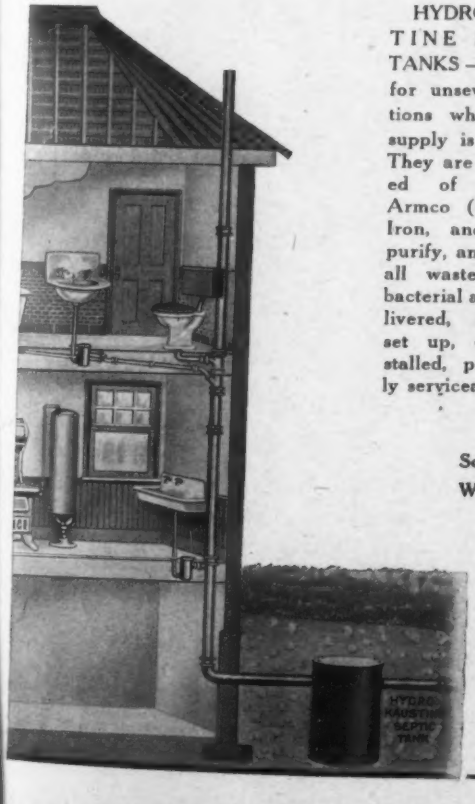
Send for our catalog H, which shows how Kaustine equipment solves the problem of sanitation in unsewered areas, and provides the convenience that keeps men healthy and satisfied.

KAUSTINE COMPANY, Inc.

Manufacturers and Sanitation Engineers

Buffalo, N. Y. Toronto, Can. Melbourne, Australia.

Southern Representatives
J. L. Murphy, Charlotte, N. C.
McKee & Son, Atlanta, Ga.



HYDRO - KAUSTINE SEPTIC TANKS — designed for unsewered sections where water supply is available. They are constructed of enameled Armco (the pure) Iron, and liquefy, purify, and disperse all waste through bacterial action. Delivered, ready to set up, easily installed, permanently serviceable.

KAUSTINE (CHEMICAL) TOILET SYSTEM—for unsewered sections WITHOUT WATER supply. Disposes of sewage thru chemical action which liquefies and purifies it. Perfect ventilation system makes it odorless. All metal parts constructed of enameled Armco (the pure) Iron. No pumping or dipping of tank contents — turning drain valve disposes of purified contents through leaching pool.

Representatives Wanted
Some desirable territory open.
Write Kaustine Company, Inc.,
Buffalo, N. Y.

Creosoting Industrial Timbers Is ECONOMY

CARBO, FIRST GRADE REFINED CREOSOTE OIL

Meets all requirements of the United States Government Shipping Board Emergency Fleet Corporation, Specification G174-A-1 and the United States Railroad Administration, Specification R-828-A.

The cheapest sap wood timbers, especially sap wood pine shingles treated with this oil **will outlast the highest grade woods untreated.**

NUMBER ONE CRUDE CREOSOTE:

An economical wood preservative for open tank or brush treating wood shingle roofs, or structural timbers. This material when properly applied greatly lengthens the life of the cheaper timbers.

PURE CREOSOTE DISINFECTANTS COEFFICIETS ONE TO TWENTY.

Each shipment tested by Ridell-Walker method and guaranteed as to carbolic strength.

Our standard disinfectants are free from sediment and tarry matter and upon dilution with water form rich, cream-like emulsions (no oily float on top nor deposit at bottom). Emulsions do not separate on standing.

Our disinfectants are manufactured by the largest Manufacturer of coal-tar products in America and are absolutely uniform.

Gulf States Creosoting Company

17 Sampson Street, ATLANTA, GA.

COOLEDGE HYGRADE

C THE CH LINE H

"Best for the Southern Climate"

C-H Bungalow Shingle Stains
For Shingle roofs and weather-boarding

C-H Home Paints
For Exterior and Interior Use

C-H Perma White
Interior gloss mill paint

Let us Send Booklet and Color Card Also names of Mills and Mill Contractors that have used our paints

"IMMEDIATE SHIPMENTS"

Just write on your letter-head— "Send Your Catalog"

F. J. COOLEDGE AND SONS
ATLANTA GA. SAVANNAH

Manufacturers of paints, stains and varnishes
Jobbers of window and building glass, and wallboard

VOGEL PATENTED

Frost Proof Closets

350,000 giving satisfaction. Save Water; Require no Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.

No. 1

Enameled roll flushing rim bowls.

Heavy brass valves.

Strong hardwood seat. Galvanized tank.

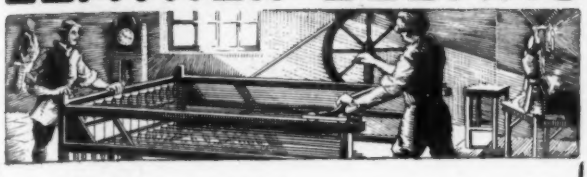
Malleable seat castings will not break.

Tested under hydraulic pressure before leaving factory.

ASK YOUR JOBBER

JOSEPH A. VOGEL CO.
WILMINGTON
DELAWARE

JEWELL LEATHER BELTING



Jewell Belt on Hargreaves Spinning Jenny—1776.

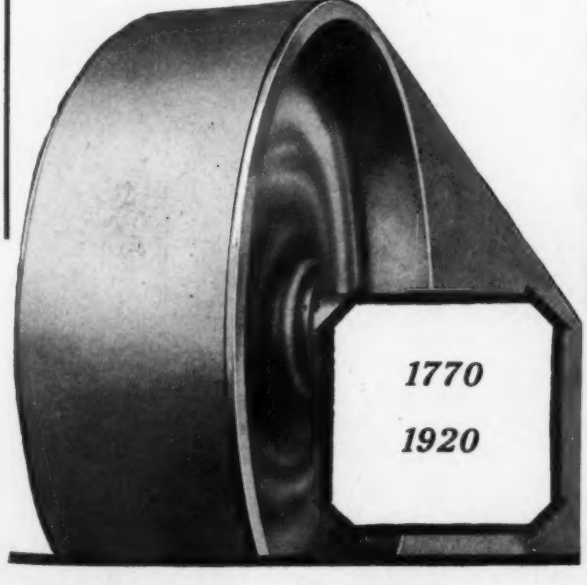
THE leather belting we have made for five generations of American manufacturers must have been good—

had it not been, we would be unable, after 150 years, to put JEWELL on our belting, and be proud of it.

Hartford, Connecticut

Western Branch

2837 So. La Salle Street, Chicago, Ill.



Join your belts so they stay joined. Whatever kind or make of belt you have—whatever its material, its width, its thickness, or its length—Crescent Belt Fasteners will insure its best service and longest life.

Write foa new Booklet M-1
On Increasing Belting Efficiency

Crescent Belt Fastener Company
381 Fourth Avenue, New York

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32 Front Street, West, Toronto, Canada

CRESCENT
Make Good Belts Give Better Service
BELT FASTENERS

The World's Greatest Belt Lacing

ALLIGATOR

TRADE MARK REG. U.S. PAT. OFFICE

STEEL BELT LACING

Consider carefully the 100 per cent efficiency of Alligator Steel Belt Lacing in satisfying your requirements. You will find it best on every kind of leather, cotton, rubber or balata belt.

Best for Every Service

Everywhere in Industry, where belting is required, Alligator Steel Belt Lacing is known and preferred.

Short, flexible joint insures smoothness of operation. Sectional Steel Rocker Hinge Pins (patented) form frictionless "rocker" for the flexible joint. In damp or heavy work, where other lacing pulls out, Alligator Steel Belt Lacing *holds*.

Simple, Strong, Economical —Preferred by All Who Know It

Makes a Perfect Joint

In a working time of less than three minutes, the average belt can be laced with Alligator Steel Belt Lacing. No special skill or training needed. No tool but a hammer to insure a perfect joint. Consider this saving in help, time and money over other methods of lacing.

Alligator Steel Belt Lacing saves the belting because the pull comes against the edge of the teeth and not the flat. It becomes a permanent part of belt—does not pull out—and replacements even in hardest use are practically unknown.

FLEXCO-LOK STEEL LAMP GUARDS

Produced in connection with our Alligator Steel Belt Lacing, and sold at a decided saving as a mechanically perfect guard.

In all sizes—standard brass or weather-proof sockets, with or without reflectors.

Either portable or stationary types, with patent self-retaining lock screw or plain round head screws. Not stocked in London

A Large Surplus of Strength

Note the *double staggered teeth* (shown in illustration)—they give the extra strength to Alligator Lacing.

Ask Your Jobber— or Write Now for Prices, Samples and Full Details

Write today—or use the coupon. Let us quote you prices and send samples and full details regarding Alligator Steel Belt Lacing. Made for belts of all sizes from tape to five-eighths inch thickness.

Hundreds of thousands of men the world over are now recommending and using no other lacing than Alligator—The World's Greatest Belt Lacing. It will be a big saving and a wonderful convenience for you. Use the coupon. Tear it off now. Write us at once.

FLEXIBLE STEEL LACING COMPANY

4619 Lexington St. Chicago, Ill., U. S. A.

135 Finsbury Pavement, London, E. C., England

SEND THIS COUPON!

FLEXIBLE STEEL LACING COMPANY,
4619 Lexington St., Chicago

Gentlemen: Kindly send price lists, sample and complete details of Alligator Steel Lacing. Also send prices and description of Flexco-Lok Lamp Guards.

Check if Desired.....

Firm Name.....

Address.....

Name of Inquirer.....

(Tear This Coupon Out—Send it Today)

Stanley Belting

on

High Speed Motor Drives

The high speed motor drive plays havoc with the ordinary belt—but STANLEY Belting has such unusual flexibility and strength that it is used successfully by many mills for such service.

It is solid woven cotton belting of a special weave that gives it the great flexibility needed to take hold of small pulleys—while its high friction cuts down starting slippage.

A Sample of Stanley Will Interest You

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E. J. Baechle .....Philadelphia, Pa.
Industrial Specialties Co...Worcester, Mass.
D. S. Lambert & Son.....Providence, R. I.
W. Y. Green Co. .....Atlanta, Ga.

Stanley Belting Corporation

36 So. Clinton St. Chicago, Ill.

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also proceed merit as surely in machinery as in men.

Time, skill and effort must also proceed merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

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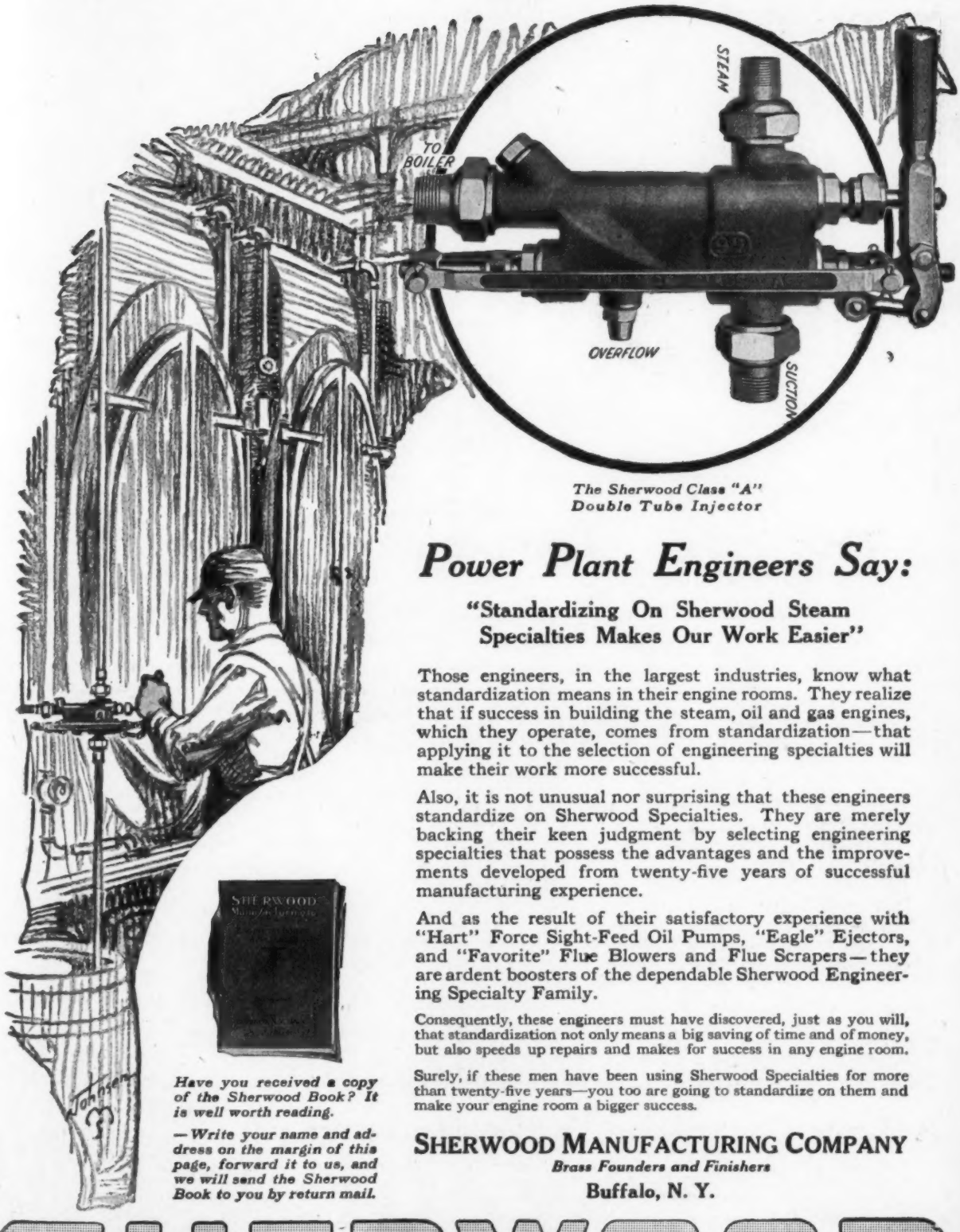

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Power Plant Engineers Say:

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Those engineers, in the largest industries, know what standardization means in their engine rooms. They realize that if success in building the steam, oil and gas engines, which they operate, comes from standardization—that applying it to the selection of engineering specialties will make their work more successful.

Also, it is not unusual nor surprising that these engineers standardize on Sherwood Specialties. They are merely backing their keen judgment by selecting engineering specialties that possess the advantages and the improvements developed from twenty-five years of successful manufacturing experience.

And as the result of their satisfactory experience with "Hart" Force Sight-Feed Oil Pumps, "Eagle" Ejectors, and "Favorite" Flue Blowers and Flue Scrapers—they are ardent boosters of the dependable Sherwood Engineering Specialty Family.

Consequently, these engineers must have discovered, just as you will, that standardization not only means a big saving of time and of money, but also speeds up repairs and makes for success in any engine room.

Surely, if these men have been using Sherwood Specialties for more than twenty-five years—you too are going to standardize on them and make your engine room a bigger success.

Have you received a copy of the Sherwood Book? It is well worth reading.

—Write your name and address on the margin of this page, forward it to us, and we will send the Sherwood Book to you by return mail.

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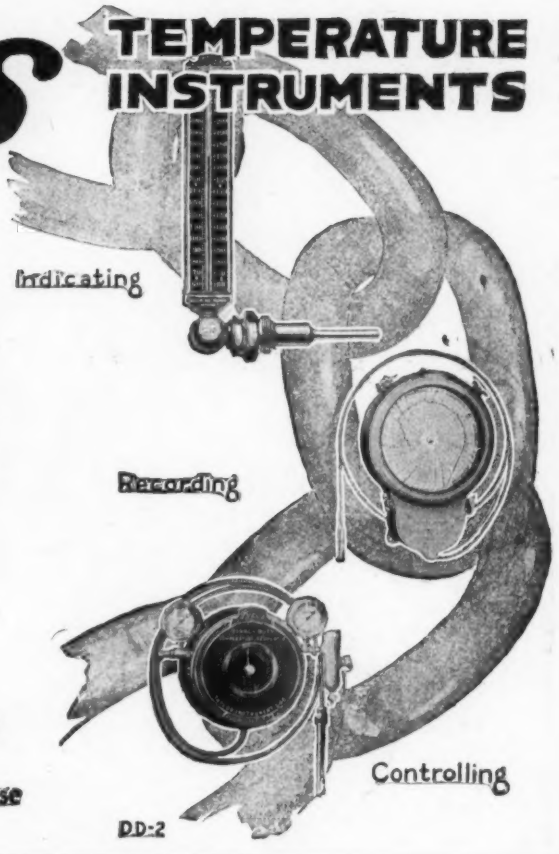

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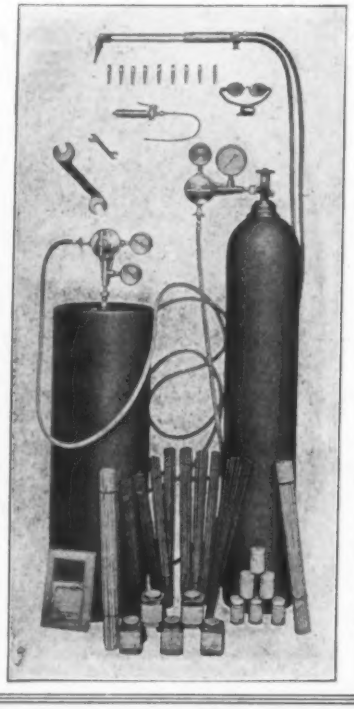

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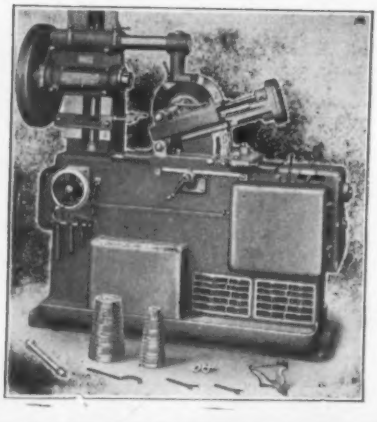

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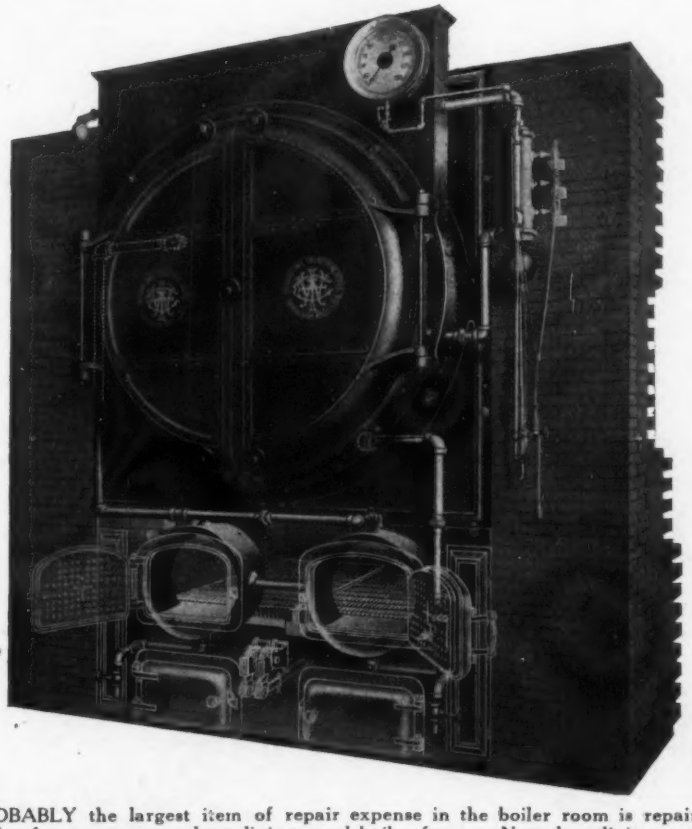

PROBABLY the largest item of repair expense in the boiler room is repairs to the front masonry, door linings and boiler fronts. New door linings, arches and side walls have to be put in at least once a year. Eliminate this unnecessary expense by putting on each boiler a

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The boiler water circulates continuously through the protectors, keeping the surrounding brick-work cool and holding the intense furnace heat back from the doors to enable the firemen to give better attention to fires. They take the place of the usual cast iron cheeks and arches or ordinary water backs that require frequent renewal and are the cause of many costly shut-downs. Made of fire-box steel with every joint electric welded. The circular shape and hollow semi-oval cross section permits easy access to fires.

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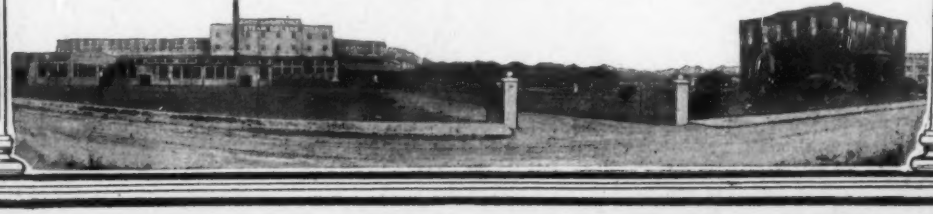

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9-16 inch fits 3-8 inch Cap Screw
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5-8 inch fits 7-16 inch Cap Screw
11-16 inch fits 3-8 inch Hexagon Nut
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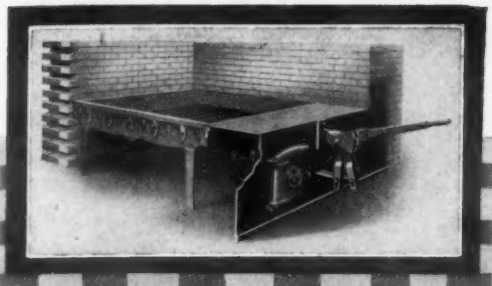

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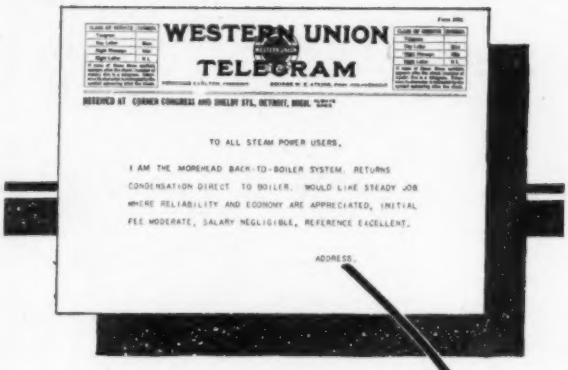
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ADDRESS.

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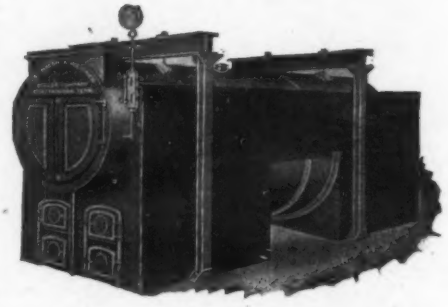

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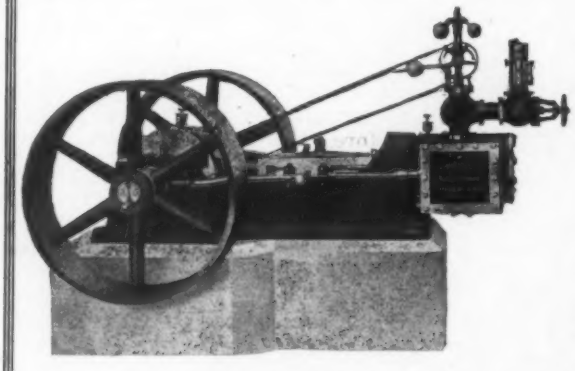

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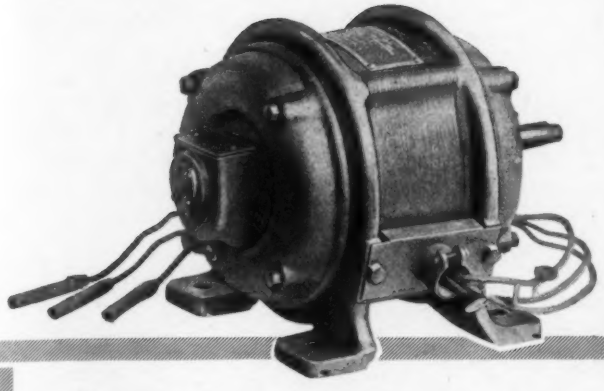

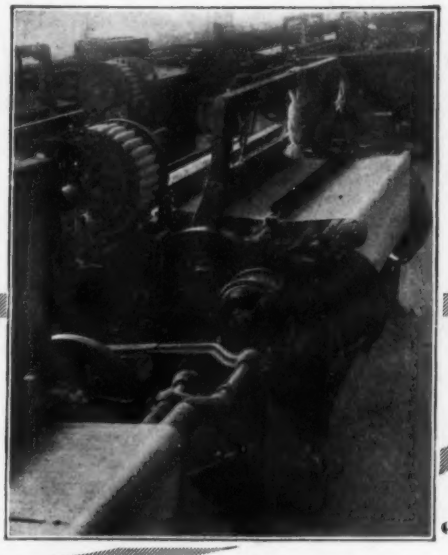

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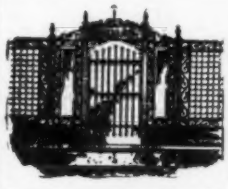

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IMPORTER AND COMMISSION MERCHANT

LINEN YARNS

For Weaving, Knitting and all Purposes

TURKEY RED YARNS

For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine

And Every Description of Linen Thread and Twine

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DRY GOODS

Commission Merchants

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1865 The Oldest National Bank in the Cotton States 1920

The Atlanta National Bank

—and its relation to—

The Entire Southeast

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The Recognized Standards of Quality

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The manufacturers of a number of America's well known textile products can vouch for the strength, uniformity, cleanliness, and better weaving and knitting qualities of our yarns.

The yarns we spin for knitting, weaving, laces and converting, are furnished in all twists on skeins, cones, tubes and warps:

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Long Distance Phone: Gramercy 812
New England Representative
H. D. Skinner,
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Arrow Mills, Inc.

Parkdale Mills, Inc.
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Arkray Mills, Inc.

Arlington Cotton Mills
Myrtle Mills, Inc.

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in the South, and especially in Georgia

You need The Citizens & Southern

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The Citizens & Southern system has completely equipped offices in Atlanta, Savannah, Macon and Augusta.

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No account too large, none too small"

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Wanted—Salesmen.

Salesmen calling on the textile mills, and interested in new lines of machinery, paints, building supplies or chemicals, either as a side line or exclusively will find it profitable to write, giving experience, territory covered and other details. Correspondence strictly confidential. Cotton, 1021 Grant Building, Atlanta, Ga.

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Electric Slat Conveyor For Sale

Manufactured by the Dow Wire & Iron Works, Louisville, Ky., with Electric Motor, 220-volt, 3-phase, 60 cycle. This equipment suitable for one story about 20 feet and is in perfect condition. Will furnish details upon request. Address.

BOSWORTH BAG COMPANY,
Memphis, Tenn.

Have You ?

Have you any proposition to put before the executives in the textile mills of the South. Anything to sell or buy that they may want or have? Do you want a better position or do you want a good man to fil a position?

Whatever your message, this "Classified Opportunities" section of COTTON is the logical place for the announcement of your requirements.

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A little ad. won't cost much. Try it for a month or so.

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"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

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S. S. STORER, M.E., C.E.
Complete plans for
Textile Mills, Commercial Buildings, Bridges.
Personal Attention, Fees Reasonable.
Atlanta, Ga.

For Sale

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ENGINES
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BOILERS
Pumps, Hoisting Engines, Gas and Gasoline Engines.
MACHINE TOOLS
Lathes, Planers, Shapers, Drill Presses, etc.
WOOD WORKING
Planers, Molders, Band Saws, etc.
ELEC. MACHINERY
Dynamos and Motors
AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,
127-31 N. Third St.
Philadelphia, - Pennsylvania

FOR SALE

3—Two Beater Kitson Breaker Lappers.
3—Single Beater Kitson Finisher Lappers.
3—Single Beater Kitson Finisher Lappers, with carding beaters.
1—Kitson Willowing Machine with fan, and hopper opener.
10—Lowell Spoolers 100 spindles each.
1—Globe Warp Machine mechanical stop motion 1450 ends 4x6 spools.
1—Globe Den Warper 2800 ends for 4x6 spools.
8—Gangs No. 50 Universal Winders with cone and tube attachment.
1—2 Head Quill Cleaner for Fielder Quills.
1—Wool Picker.
1—Jute Picker.
3—Proctor Dryers.
1—Broadbent Steam Extractor.

We also represent the Griffin Tire Cleaner & Straightener Co.

C. L. UPCHURCH, TEXTILE MACHINERY
825 Austell Building, Phone Ivy-5611. P. O. Box 1411, Atlanta, Georgia.

KNITTING MACHINES FOR SALE

8 176 Needle (88x88) 3¾" 36 gauge Wildman Ribbers
15 128 Needle (64x64) 3¾" 24 gauge Wildman Ribbers
Two-feed, with stop motions and roll take-ups. Designed for knitting plain tubing for canvas gloves. Excellent machines—$115 each, crated f.o.b. cars.
25 132 needle 3¾" 24 gauge Invincible Knitters
6 124 needle 3½" 24 gauge Invincible Knitters
Complete for making Men's Half Hose-yarn changers and reinforcing attachments, one transfer ring and double drive pulley each machine.
Price $20 each for the lot boxed f.o.b. cars.
1 24" Jones two cylinder Napper, in first-class order. $50 f.o.b. cars.

J. Broadbent & Son, Inc.
Unionville, Conn.

FOR SALE—DRY PRESSED PINE BOARDS

We offer to the textile trade the following stock of thoroughly dry short leaf No. 2 pine boards. Well manufactured:

20,000 ft. 1 x 4 Dressed 13/16 x 3½" Face
100,000 ft. 1 x 6 Dressed 13/16 x 5½" Face
180,000 ft. 1 x 8 Dressed 13/16 x 7½" Face
100,000 ft. 1 x 10 Dressed 13/16 x 9½" Face
50,000 ft. 1 x 12 Dressed 13/16 x 11½" Face

Buildings made from this lumber will last as long, and when painted look practically as well as the higher grades. Send us your orders and cut your building cost.

Ezell-Griffin Co. **Eatonton, Ga.**

Buyers' Index

Acetylene Welding Apparatus.
(See Welding Apparatus.)

Acetylene Gas.
Commercial Acetylene Supply Co.
Linde Air Products Co.
Oxweld Acetylene Co.
Prest-O-Lite Co.
Southern Welding Co.
Standard Gas Products Co.
Waterhouse Welding Co.

Accountants.
(See Auditors and Accountants.)

Air Brakes.
Allis-Chalmers Mfg. Co.

Air Washers
American Blower Co.
Carrier Eng. Corp.
New York Blower Co.
Parks-Cramer Co.
Sturtevant Co., B. F.

Air Conditioning Systems.
(See Humidifying Apparatus.)

Albone.
Roessler & Hasslacher Chemical Co.

Alkalies.
(See Dyestuffs and Chemicals.)

Aniline Colors.
(See Dyestuffs and Chemicals.)

Anti-Chlorine.
(See Dyestuffs and Chemicals.)

Aprons-Rub.
Ladew & Co., Inc., Edw. R.
Smith & Furbush Machine Co.
Graton & Knight Mfg. Co.

Architects and Engineers.
American City Eng'g Co.
Draper, E. S.
Ferguson Co., John W.
Lockwood, Greene & Co.
Robert & Co.
Sirrine, J. E.
Thompson & Binger, Inc.

Ash Handling Machinery.
(See Coal Handling Machinery.)

Asphalt Slate Shingles.
(See Slate Asphalt Roofing.)

Auditors and Accountants.
American Audit Co.
Ernst & Ernst.

Auto Trucks.
(See Trucks—Auto.)

Automatic Controllers (Temperature.)
See Temperature Controllers.

Automatic Loom Attachments.
(See Loom Attachments.)

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Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Saco Lowell Shops.
Sarent's Sons Corp., C. G.
Smith & Furbush Mch. Co.
Whitin Mch. Works.

Backwashers.
Sarent's Sons Corp., C. G.

Automatic Scales.
American Kron Scale Co.

Ball Bearings.
Aldrich Mch. Works.
Hyatt Roller Bearing Co.
New Departure Mfg. Co.
S K F Industries.
U. S. Ball Bearing Co.

Ball Bearing Spindles.
Allen Spindle Corp.

Ball Bearing Housings.
Aldrich Mch. Works.

Bale Band Buckles.
(See Box Strapping & Buckles.)

Bale and Box Ties.
Acme Steel Goods Co.
Lovingood Co.
Regnas & Co., J. R.
Signode System, Inc.

Baling Machines.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Galland-Henning Mfg. Co.
Hulme, J. S.
Saco-Lowell Shops.

Baling Presses.
(See Presses.)

Bandages, Tapes, Etc.
American Textile Banding Co.

Banding Straps and Buckles.
Acme Steel Goods Co.
Lovingood Co.
Regnas & Co., J. R.
Signode System, Inc.

Banks.
Atlanta National Bank.
Citizen & Southern Bank.
Irving National Bank.
National Bank of Commerce in New York.
National Shawmut Bank.
Textile Banking Co., Inc.

Bars (Corrugated for Concrete Reinforcement).
Corrugated Bar Co.

Barometers (Mercurial).
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

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(See Fibre Products.)

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(See Storage Batteries).

Beam Dyeing Machines.
Cocker Mchry. & Foundry Co.

Beam Heads (Steel).
Mossberg Co., Frank

Beaming and Warping Mchry.
(See Warpers and Warping Machinery).

Bearings.
Chicago Pulley & Shafting Co.
Cresson-Morris Co.
Diamond State Fibre Co.
Hyatt Roller Bearing Co.
New Departure Mfg. Co.
Standard Pressed Steel Co.
S K F Industries.
U. S. Ball Bearing Co.
Valley Iron Works.

Belting.
American Supply Co.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
Russell Mfg. Co.
U. S. Rubber Co.
Walraven Co.
Williams & Co., I. B.

Belting—Chain Link.
Link-Belt Company.
Morse Chain Co.

Belting—Rope.
(See Rope Transmission.)

Belt Conveyors.
Link-Belt Company.
Morse Chain Co.
Portable Machinery Co.
Williams & Sons, I. B.

Belt Dressing.
Jos. Dixon Crucible Co.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
Walraven Co.
Williams & Co., I. B.

Belt Fasteners.
Crescent Belt Fastener Co.
Flexible Steel Lacing Co.

Belt Hooks.
Crescent Belt Fastener Co.

Belt Lacing.
Crescent Belt Fastener Co.
Flexible Steel Lacing Co
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
Stanley Belting Corp.
Walraven Co.
Williams & Sons, I. B.

Belt Rivets.
Crescent Belt Fastener Co.

Belt Tighteners.
Link-Belt Company.
Williams & Sons, I. B.

Benches (Park & Playground).
Hill-Standard Co.

Billiard Tables & Etc.
Brunswick-Balke-Collender Co.

Bleacheries.
(See Dyers, Bleachers and Finishers.)

Bleaching Kiers.
Butterworth & Sons Co., H. W.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machinery Co., The

Bleaching Machinery.
(See Dyeing, Bleaching & Finishing Machinery).

Bleaching, Finishing and Sizing Materials.
(See Finishing Materials.)

Blowers and Blower Systems.
American Blower Co.
Carrier Eng. Corp.
General Electric Co.
New York Blower Co
Perkins & Son, B. F.
Phila. Drying Machinery Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Boards—Fibre.
Diamond State Fibre Co.

Boards—Form.
Pearson, Jos. T.

Bobbins.
Draper Corporation.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.
Shambow Shuttle Co.
Whitin Machine Works.

Bobbin Heads.
Diamond State Fibre Co.

Boilers.
Crymes Mchry. & Supply Co.
International Engineering Wks., Inc.
Jones Mchry. Corp.
Lombard Iron Works & Supply Co.
Schofield's Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

Boiler Feed Water Purification.
Permutit Co.
Refinite Co.
Scaife & Sons, Wm. B.

Boiler Room Fittings & Supplies.
Crane Co.
International Engineering Co.
Jenkins Bros.
Lunkenheimer Co.

Boiler Graphite.
Jos. Dixon Crucible Co.

Box Strapping and Tie Buckles.
Acme Steel Goods Co.
Lovingood Co.
Regnas & Co., J. R.
Signode System, Inc.

Boxes—Mill.
Diamond State Fibre Co
Hightower Box & Tank Co.
Keystone Fibre Co.
Lane & Bros., W. T.
Rogers Fibre Co.
Standard Fibre Co.

Boxes (Packing).
Hightower Box & Tank Co.
Walke Box Co., Inc.
Wall & Son, C. M.

Bowling Alleys, Etc.
Brunswick-Balke-Collender Co.

Braids.
(See Tapes.)

Brake Linings.
Diamond State Fibre Co.

Brazing.
(See Welding).

Brushes—Mill.
Felton Brush Co., D. D.
Felton, S. A. & Son Co.

Brushes—Commutator.
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Buckets & Pails—Mill.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.

Buckets—Elevator and Grab.
Link-Belt Company.

Buckles—Cotton Tie.
(See Box Strapping and Ties).

Building Contractors.
(See Contractors.)

Buildings—Portable.
Lockwood, Greene & Co.

Building Material.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Barrett Co., The
Corrugated Bar Co.
Detroit Steel Products Co.
Dufur & Co.
High-Grade Mfg. Co.
Hurst Co.
Kirkpatrick Lumber & Timber Co.
Lockwood, Greene & Co.
Nashville Hardwood Flooring Co.
Peaslee-Gaulbert Co., Inc.
Portland Cement Asso.
Southern Cypress Mfg. Asso.

Burr Pickers.
Sargent's Sons, C. G.
Smith & Furbush Machine Co.

Bushings.
Diamond State Fibre Co.
Southern Spindle & Flyer Co.

Calenders.
Butterworth & Sons Co., H. W.
Textile Finishing Mchy. Co.

Calender Rolls.
Butterworth & Sons Co., H. W.
Roy & Son, B. S.
Perkins & Son, Inc., B. F.

Calendering Machine for Rolls.
Simplex Roll Calendering Machine Co.

Calling System (Inter Telephone).
Carter Elec. Co.

Cans—Roving.
Diamond State Fibre Co.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.

Cars and Trucks—Fibre.
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Car Unloaders.
Portable Machinery Co

Carbonizing Machines.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargents Sons & Co., C. G.
Textile Finishing Machinery Co., The

Carding Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Card Clothing.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

TRY OUR HARD FIBRE
—BARRELS—

The Last Word in
Durability and Service

TAPER
BASKETS

—

OVAL
and
GILL
CANS

NO-WASTE
SEAMLESS HARD FIBRE
ROVING CANS

"Standard Fibre"
RECEPTACLES

HARD FIBRE TRUCKS
and
BOXES

PLAIN and STEEL CLAD
COMBINATION
DOFFING CARS

Are smooth and durable. No joints or seams—ONCE tried—ALWAYS used.

STANDARD FIBRE CO.

25 Miller St., Somerville, Mass.

J. H. LANE & CO.

INCORPORATED

NEW YORK

Selling Agents for

Cotton Mill Products

BOSTON CHICAGO

BUYERS' INDEX—Continued.

Card Feeds.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.
Whitin Machine Co.

Card Grinding Machinery.
Roy & Son Co., B. S.
Smith & Furbush Mch. Co.
Whitin Machine Works.

Carpet Machinery.
Butterworth, H. W., & Sons Co.
Crompton & Knowles Loom Wks.
Proctor & Schwartz, Inc.
Schofield, Wm. Co.
Smith & Furbush Mch. Co.
Textile Finishing Mchy. Co., The

Carrier Aprons.
(See Aprons.)

Cases (Wooden).
(See Boxes.)

Casement Window Hardware.
Richards-Wilcox Mfg. Co.

Castings.
American Cast Iron Pipe Co.
Cresson-Morris Co.
Lombard Foundry & Mch. Co.
McNaughton Mfg. Co.
Valley Iron Works.
Walsh & Weidner Boiler Co.

Cast Iron Columns.
American Cast Iron Pipe Co.

Caustic Soda.
(See Bleaching Materials.)

Cement Machinery.
Allis-Chalmers Mfg. Co.

Cement Reinforcement.
Corrugated Bar Co.

Cement and Brick Coating.
Cooledge & Sons, F. J.
Dixon Crucible Co., Jos.
Hurst Co.
Peaslee-Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth Howland & Co., Inc.

Centrifugals.
Cresson-Morris Co.

Chain Drives.
(See Belting—Chain Link.)

Chain (Block, Bicycle, Auto Engine, Agricultural, Etc.)
Morse Chain Co.

Chairs and Stools
Reischmann Co.
Wright Co.

Checks—Metal.
(See Stamps, Stencils, etc.)

Chemicals.
(See Dyestuffs and Chemicals.)

Chlorine Gas.
Electro Bleaching Gas Co.

Cleaning Machine (Suction)
United Electric Co.

Clocks (Hank, Etc.)
(See Counters.)

Clocks (Time).
Eco Clock Co.

Clocks (Watchman).
Eco Clock Co.
Chicago Watchman Clock Wks.
Dixie Electric Equip. Co.

Closets (Water).
(See Toilets.)

Cloth Cutters.
Firsching, J. A.
Wildman Mfg. Co.

Cloth Room Machinery.
Butterworth, H. W. & Sons Co.
Firsching, J. A.
Saco-Lowell Shops.
Scott & Co., Henry L.
Textile Finishing Machinery Co.
Wildman Mfg. Co.

Cloth Shrinking Machinery.
Reliance Machine Works.

Cloth Testers.
Scott & Co., Henry L.

Cloth Winders.
(See Winders)

Clutches (Friction.)
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.

Clutch Linings.
Diamond State Fibre Co.

Coal Driers (Centrifugal).
Link-Belt Company.

Coal Handling Machinery.
Link-Belt Company.
Portable Machinery Co.

Coal Tar Disinfectants.
(See Disinfectants.)

Cocks.
Lunkenheimer Co.

Color Pails.
(See Buckets—Mills.)

Color Testers.
Atlas Electric Devices Co.

Comb Aprons.
(See Aprons.)

Commission Merchants and Dealers.
(See Cotton Cloth Commission Merchants.)

Compressors, Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Walraven Co., The

Concrete Reinforcement.
Corrugated Bar Co.

Condensers.
Allis-Chalmers Mfg. Co.
Seeger Machine Tool Co.

Conduits.
Diamond State Fibre Co.

Condulets.
Crouse-Hinds Co.

Connectors (Frankel Solderless)..
Westinghouse Elec. & Mfg. Co.

Consulting Engineers.
(See Architects & Engineer.)

Contractors and Engineers (Building).
Aberthaw Construction Co.
American City Eng'g Co.
Ferguson Co., Jno. W.
Goode, R. L.
Gude, & Co.
Green & Co., Samuel M.
Robbins & Son, J. E.
Thompson & Binger.

Contractors (Electrical).
(See Electrical Engineers.)

Controlling Instruments (Temperature).
Powers Regulator Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Conveyors (Belt).
(See Belt Conveyors.)

Conveying Machinery.
American Supply Co.
Collins, J. D.
Cresson-Morris Co.
General Utilities Co.
Hulme, J. S.
Link-Belt Co.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Portable Machinery Co.
Richards-Wilcox Mfg. Co.
Saco-Lowell Shops.
Seeger Machine Tool Co.
Schofield, Wm. Co.
Walraven Co.
Smith & Furbush Machine Co.
Valley Iron Works.
Whitin Machine Works.

Conveyors (Portable).
Portable Machinery Co.

Coolers.
(See Humidifying Apparatus.)

Coolers (Water).
(See Water Coolers.)

Cooling Towers.
(See Tanks and Towers.)

Copper Stamps and Stencils.
(See Stamps, Stencils, Etc.)

Cordage Machinery.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co. The.

Corrugated Bars.
Corrugated Bar Co.

Cotton Yarn and Cloth Commission Merchants and Dealers.
Carver-Beaver Yarn Co., Inc.
Fawcett, Hughes.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Iselin & Co., Wm.
Lane, J. H. & Co.
Southern Cotton Yarn Co.
Weimar Bros.
Woodward Baldwin & Co.

Cotton Dealers and Brokers.
Beer, H. & B.
Cutts, E. A.
Dixie Cotton Waste Co.
International Cotton Prod. Co.

Cotton Mill Machinery and Supplies.
Allen Spindle Corp.
Barber-Colman Co.
Butterworth & Sons, H. W.
Cocker Mch. & Foundry Co.
Crymes Mchry. & Supply Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Firsching, J. A.
Fletcher Works.
Greenville Spool & Mfg. Co.
Howard & Bullough.
Jones Mchry. Corp.
Mason Machine Works.
Phila. Drying Mchy. Co.
Proctor & Schwartz, Inc.
Sargent's Sons, Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Stafford Co.
Steel Heddle Mfg. Co.
Terrell Machine Co.
Textile Finishing Machinery Co.
Universal Winding Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

Cotton Tape Loom.
Fletcher Works.
Schaum & Uhlinger.

Cotton Yarn Mills.
(See Yarn Manufacturers.)

Counters (Revolution, Hank, Pick, Etc).

Veeder Mfg. Co.
Percision Machine Co.

Couplings (Shaft).
Chicago Pulley & Shafting Co.
Cresson-Morris Co.

Covers (Roller).
Diamond State Fibre Co.

Cranes
(See Hoists.)

Crayons.
Dixon Crucible Co., Jos.
Lovingood Co.
Lowell Crayon Co.
Regnas & Co., J. R.

Creosote Oil and Creosoting.
Gulf States Creosoting Co.

Crushing Machinery.
Allis-Chalmers Mfg. Co.

Cutters (Cloth).
(See Cloth Cuters.)

Cypress Lumber.
Southern Cypress Mfg. Asso.
(See Thread Cutters.)

Dairy Supplies.
Dairy & Farm Supply Co.
Hackney Bros. Co.

Deep Wells.
Hughes Specialty Well Drilling Co.

Deep Well Supplies.
Hughes Specialty Well Drilling Co.

Dehumidifying.
Sturtevant Co., B. F.

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Dial Scales.
American Kron Scale Co.

Dies (Steel).
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Discs (Fibre).
Diamond State Fibre Co.

Dishes and Glassware.
Chattanooga Queensware Co.

Disinfectants.
Barrett Co., The

Dobby Chains.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

Doffing Boxes (Mill).
(See Boxes—Mill.)

Doffing Cars.
(See Cars.)

Door Closers and Checks.
Richards-Wilcox Mfg. Co.

Door Hangers.
Richards-Wilcox Mfg. Co.

Door Mats (Steel).
Acme Steel Goods Co.
Lovingood Co.
Regnas & Co., J. R.

Draft Gauges.
Taylor Instrument Co.

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Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

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Sturtevant Co., B. F.

Drying Forms (Hosiery).
Pearson, Jos. T.

Drying Machinery.
American Laundry Mchry. Co.
Butterworth, H. W. & Sons Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The

Dust Collectors.
(See Blowers and Blowing Systems.)

Dusting Machinery.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Dyers, Bleachers and Finishers.
American Processing Co.

Dyeing, Bleaching, Finishing and Printing Machinery.
American Laundry Mchry. Co.
Atlas Electric Devices Co.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Hulme, J. S.
Permutit Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Refinite Co.
Reliance Machine Works.
Rome Mch. & Fdry. Co.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The
Tolhurst Machine Works.

Dye Sticks.
Phila. Drying Machinery Co.

Dyestuffs and Chemicals.
Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Grasselli Chemical Co.
Hemingway Inc., Frank
Kali Mfg. Co.
Klipstein & Co., A.
Lewis, John D.
Metz & Co., H. A.
Moore Oil Refining Co.
National Aniline & Chemical Co.
National Oil Products Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Sumass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques

Electric Cleaning System (Suction)
United Electric Co.

Ejectors.
Sherwood Mfg. Co.

Electric Dynamos and Motors.
(See Motors and Generators.)

Electric Fans.
(See Fans—Electric.)

Electric Lamps.
(See Lamps.)

Electric Lamp Guards.
Flexible Steel Lacing Co.

Electrical Engineers and Contractors.
Dixie Electrical Equipment Co.
Huntington & Guerry, Inc.

Electrical Machinery and Supplies.
Allis-Chalmers Mfg. Co.
Atlas Electric Devices Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
Crouse-Hinds Co.
Cutter Co., George.
Crymes Mchry. & Supply Co.
Dixie Electrical Equipment Co.
Economy Fuse & Mfg. Co.

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BUYERS' INDEX—Continued.

General Electric Co.
Hulme, J. S.
Jones Mchry. Corp.
Multiple Electric Products Co.
Phila. Electric Co.
Seeger Machine Tool Co.
United Electric Co.
Wairaven Co., The
Walsh & Weidner Boiler Co.
Westinghouse Electric & Mfg. Co.

Electrical Repairing (all kinds).
Bryan Electric Co.
Dixie Electrical Equipment Co.

Electric Tractors and Trucks.
(See Tractors & Trucks—Elec.)

Elevators.
Collins, J. D.
Link-Belt Company.
Seeger Machine Tool Co.

Enamel—Mill White.
(See Paint—Mill White.)

Engineers (Mill).
(See Architects.)

Engines—Oil, Gas and Gasoline.
Crymes Mchry. & Supply Co.
Seeger Machine Tool Co.

Engines—Steam.
Allis-Chalmers Mfg. Co.
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
Lombard Iron Works & Supply Co.
Schofield's Sons Co., J. S.
Toomey, Frank
Walsh & Weidner Boiler Co.

Engine Room Appliances and Supplies.
Crane Co.
Crymes Mchry. & Supply Co.
Cutter Co., George.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jenkins Bros.
Jones Mchry. Corp.
Lunkenheimer Co.
Sherwood Mfg. Co.
Walraven Co.

Exporters (Cotton).
(See Brokers.)

Extractors—Hydro.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

Fans—Electric.
Allis-Chalmers Mfg. Co.
American Blower Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Fans—Conveying, Power and Exhaust.
(See Blowers and Blowing Systems.)

Fasteners (Belt).
(See Belt Fasteners.)

Feed Water Purifiers.
Permutit Co.
Refinite Co.
Scaife & Sons, Wm. B.

Felting Machinery.
Smith & Furbush Mch. Co.

Fence—Steel and Iron.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Cyclone Fence Co.

Fibre Products.
Diamond State Fibre Co.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.

Filters—Water.
Refinite Co.
Scaife & Sons Co., Wm. B.

Filters (Oil Removal).
Permutit Co.
Sherwood Mfg. Co.

Filters (Sand).
Permutit Co.

Finishing.
(See Dyers, Bleachers and Finishers.)

Finishing, Bleaching and Sizing Materials.
Althouse Chemical Co.
Atlantic Dyestuff Co.
Aniline Dyes & Chemical, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Barrett Co.
Berne, Schrymser Co.
Bessen & Lane.
Corn Products Refining Co.
Dobbins Soap Mfg. Co.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Alum. Co.
Electro Bleaching Gas Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Keever Starch Co.
Klipstein & Co., A.
National Oil Products Co.
Newport Chemical Works.
Metz & Co., H. A.
Moore Oil Refining Co.
National Aniline & Chemical Co.
Roessler & Hasslacher Co.
Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques
World Mfg. Co.

Fire Alarm Apparatus.
Dixie Electric Equip. Co.

Fire Doors.
Richards-Wilcox Mfg. Co.

Fire Door Hardware (Automatic).
Richards-Wilcox Mfg. Co.

Fire Escapes (Spiral).
Collins, J. D.

Fire Hose.
(See Hose—Fire.)

Fire Protecting Paint.
(See Paint—Fireproof).

First Aid Room Equipment.
(See Hospital Equipment.)

Flexible Couplings.
Cresson-Morris Co.

Flood Lights (Elec.)
Crouse-Hinds Co.

Flooring (Hardwood).
Kirkpatrick Lum. & Timber Co.
Nashville Hardwood Flooring Co.
Southern Cypress Mfg. Co.

Floor Scrubbing Machine.
American Scrubbing Machine Co.

Fluted Rolls.
Howard & Bullough.
Perkins & Son, B. F.
Saco-Lowell Shops.
Schofield's Sons Co., J. S.
Smith & Furbush Machine Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Flyers.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Founders.
Cresson-Morris Co.

Fountains (Drinking).
Central Brass Mfg. Co.
Crane Co.
Jewett Refrigerator Co.
Mott-Southern Co.
Rundle-Spence Mfg. Co.
Southern States Supply Co.
Taylor Co., Halsey W.

Friction Clutches.
(See Clutches—Friction.)

Fuses.
(See Elec. Mchy. and Supplies.)

Garage Door Hardware.
Richards-Wilcox Mfg. Co.

Garnett Machines.
Roy Son Co., B. S.
Smith & Furbush Mach. Co.

Gas Engines.
(See Engines—Gas.)

Gasoline Tanks and Pumps.
Wayne Oil Tank & Pump Co.

Gaskets.
Diamond State Fibre Co.
Graton & Knight Mfg. Co.

Gauge Cocks.
Lunkenheimer Co.

Gauges—Draft.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Gauges—Mercury Column Vacuum.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Gauges—Oil.
Lunkenheimer Co.

Gauges (Pressure).
Tagliabue Mfg. Co., C. J.

Gauges (Recording).
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co

Gauges—Water.
Lunkenheimer Co.

Gears—Silent.
Diamond State Fibre Co.
General Electric Co.
Link-Belt Company.
Morse Chain Co.

Gear Cutting and Cutters.
Cresson-Morris Co.
Southern Welding & Machine Co.
Reischmann Co.
Whitin Mch. Co., D. E.

Gear Pullers.
Greb Co., Inc.

Generators—Electric.
(See Motors and Generators.)

Glassware and Dishes.
Chattanooga Queensware Co.

Governors (Pressure).
Tagliabue Mfg. Co., C. J.

Governors (Pump).
Tagliabue Mfg. Co., C. J.

Graphite—Products.
Dixon Crucible Co., Jos.

Grates (Boiler).
International Eng. Works.
Lombard Fdy. & Mch. Co.
McNaughton Mfg. Co.

Grease.
(See Lubricants.)

Grease Cups.
(See Lubricators.)

Green Houses.
Hulme, J. S.

Grindstones.
Richards-Wilcox Mfg. Co.

Grinders—Card, Cylinder Roll, Napper and Garnett.
(See Card Grinding Machinery.)

Guards (Elec. Lamp.)
Flexible Steel Lacing Co.

Guides (Thread).
Mitchell-Bissell Co.
Palmer Co., I. E.

Gums.
(See Finishing and Sizing Materials.)

Hangers.
(See Shafting and Hangers.)

Harness—Loom.
American Supply Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Garland Mfg. Co.

Heads (Bobbin & Spool).
Diamond State Fibre Co.

Heating and Ventilating Apparatus.
(See Ventilating Apparatus.)

Heddles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Steel Heddle Mfg. Co.

Heddle Frames.
Crompton & Knowles Loom Wks.
Steel Heddle Mfg. Co.

Hinges & Butts.
McKinney Mfg. Co.

Hoists.
General Utilities Co.
Hulme, J. S.
Link-Belt Company.
Morse Chain Co.
Pasco Tool Co.
Seeger Machine Tool Co.
Walraven Co.

Hose—Fire.
Collins, J. D.
Goodyear Tire & Rubber Co.
U. S. Rubber Co.

Hosiery Dyeing Machinery.
Cocker Mch. & Fdry. Co.
Rome Mach. & Fdry. Co.

Hosiery Finishing Boards.
(See Boards.)

Hosiery Forms.
(See Drying Forms.)

Hosiery Yarns.
(See Yarn Manufacturers.)

Hospital Equipment.
Thomas Co., F. H.
Wright Co.

Hotels.
Sinton.

Houses (Ready-Made).
(See Bungalows.)

Humidifying Apparatus.
American Blower Co.
Carrier Eng. Corp.
New York Blower Co.
Parks-Cramer Co.
Sturtevant Co., B. F.

Humidity Indicating Instruments.
Powers Regulator Co.
Tagliabue Mfg. Co., C. J.
Taylor Inst. Co.

Hydraulic Turbines.
(See Turbines—Steam.)

Hydro Extractors.
(See Extractors.)

Hydrometers.
Taylor Instrument Co.

Hygrometers.
Taylor Instrument Co.

Hygrodeiks.
Taylor Instrument Co.

Indicating and Recording Instruments and Thermometers.
Powers Regulator Co.
Taylor Instrument Co.
Tagliabue Mfg. Co., C. J.

Indigo.
(See Dyestuffs and Chemicals.)

Industrial Relationship Service.
Sherman Service, Inc.

Injectors.
Lunkenheimer Co.
Sherwood Mfg. Co.

Insulation (Vulcanized Fibre).
Diamond State Fibre Co. Sal

Insurance.
Miller Indemnity Underwriters.

Ink—Stencil and Marking.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.
National Marking Machine Co.
Regnas & Co., J. R.

Iron Work—Ornamental.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Cyclone Fence Co.
Dufur & Co.
Lombard Iron Works & Supply Co.

Jacks.
Paulus, Chas. B.

Jacquards.
Crompton & Knowles Loom Wks.

Jute Bagging Machines.
Smith & Furbush Mach. Co.

Kettles—Size.
(See Size Kettles.)

Kettles—Soda.
Lombard Iron Works & Sup. Co.

Kiers.
(See Bleaching Kiers.)

Knit Goods.
(See Cotton Cloth Commission Merchants and Dealers.)

Knit Goods Washers.
(See Washers—Cloth.)

Knitting Machinery and Supplies.
Adams Co., Geo. H.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Scott & Williams.
Wildman Mfg. Co.

Laboratory Instruments & Thermometers.
Tagliabue Mfg. Co., C. J.

Lacing (Belt).
(See Belt Lacing.)

Lamps—Incandescent and Arc.
Benjamin Electric Co.
Boston Economy Lamp Div.
Bryan Electric Co.
Carter Electric Co.
Crouse-Hinds Co.
Cutter Co., George.
General Electric Co.
Jones Mchry. Corp.
Walraven Co.
Westinghouse Lamp Co.

Lamp Guards (Key Locking).
Flexible Steel Lacing Co.

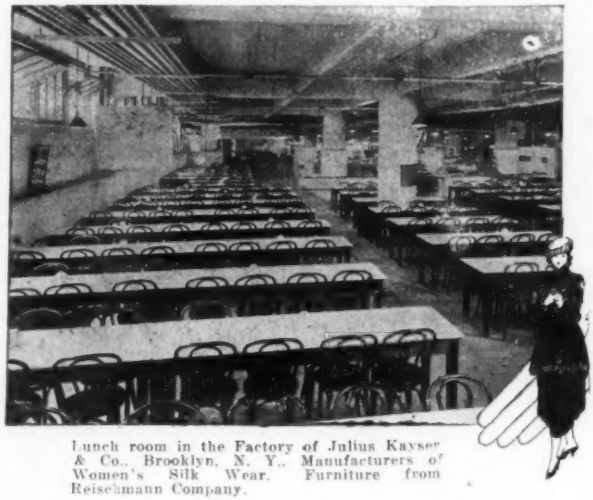
Lamp Reflectors.
Benjamin Electric Co.
Bryan Electric Co.
Carter Elec. Co.
Crouse-Hinds Co.
Cutter Co., George.
Ivanhoe-Regent Works.

Landscape Architects.
(See Village Architects.)

Lappers.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Latch Needles.
Paulus, Chas. B.

Laundry Machinery.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Wks.



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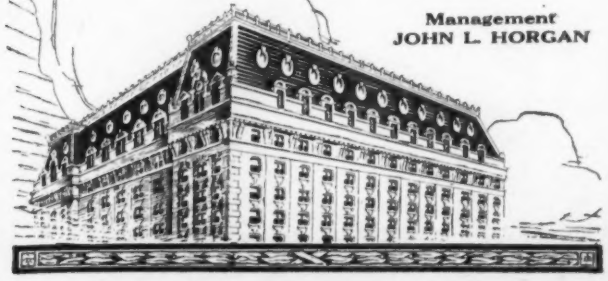

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BUYERS' INDEX—Continued.

Lavatories.
Crane Co.
Mfg. Equipment & Eng'g Co.
Taylor Co., Halsey W.
Jos. A. Vogel Co.

Leather Belting.
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Leather Specialties.
American Supply Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
Williams & Sons, I. B.

Lights (Flood).
Crouse-Hinds Co.

Linen Yarns.
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Link Belting.
(See Belting—Linen.)

Linters.
(See Waste Dealers.)

Liquid Chlorine.
(See Chlorine.)

Loaders—Wagon and Trucks.
Link-Belt Company.
Portable Machinery Co.

Locks and Latches.
Richards-Wilcox Mfg. Co.

Lockers (Metal).
Collins, J. D.
Medart Mfg. Co., Fred.

Logwood Extract.
(See Dyestuffs and Chemicals.)

Looms.
Crompton & Knowles Loom Wks.
Draper Corporation.
Fletcher Works.
Jones Mchry. Corp.
Mason Machine Works.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield, Wm. & Co.
Stafford Co., The

Loom Attachments (Automatic).
Draper Corporation.

Loom Harness.
(See Harness.)

Lubricants.
Dixon, Jos., Crucible Co.
N. Y. & N. J. Lubricant Co.
Swan & Finch Co.
Texas Co.

Lubricant, Tanks and Pump.
Wayne Oil Tank & Pump Co.

Lubricators.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.
Sherwood Mfg. Co.

Lug Straps.
(See Straps—Lug.)

Lumber.
Kirkpatrick Lum. & Timber Co.
Southern Cypress Mfg. Asso.

Lunch Room Equipment.
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Machine Tools.
(See Tools.)

Machinists.
Cresson-Morris Co.

Marking (Dry Transfer).
Kaumagraph Co.

Marking Pots, Stencils, Inks, Etc.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.
National Marking Machine Co.
Regnas & Co., J. R.

Marking Machines.
National Marking Machine Co.

Mercerized Yarns.
(See Yarns Mercerized.)

Mercerizing Machinery.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Metal Ceilings, Etc.
Lupton's Sons Co., David

Metals (Perforated).
(See Screens and Sieves.)

Metal Workers—Sheet.
Lombard Iron Works & Supply Co.

Meters—Flow, Air, Gas, Electric, Steam, Etc.
Allis-Chalmers Mfg. Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
General Electric Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.
Westinghouse Elec. & Mfg. Co.

Meters (Revolution).
Taylor Instrument Co.

Mill Baskets and Boxes.
(See Boxes—Mill.)

Mill Engineer.
(See Architects and Engineers.)

Mill Villages.
(See Villages.)

Mill Supplies (Misc.).
(See Supplies—Mill).

Mill White Paint.
(See Paint—Mill White.)

Monorail Conveying Systems.
Richards-Wilcox Mfg. Co.

Motors and Generators—Electric.
Allis-Chalmers Mfg. Co.
Bryan Electric Co.
Carter Electric Co.
Crymes Mchry. & Supply Co.
Dixie Electrical Equipment Co.
General Electric Co.
Hulme, J. S.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Walraven Co., The
Westinghouse Elec. & Mfg. Co.

Moving Picture Mach. & Supplies.
Southern Theatre Equip. Co.

Mule Stands.
Transmission Ball Bearing Co.

Nails—Cement Coated.
Lovingood Co.
Regnas Co., J. R.

Nappers.
Roy & Son Co., B. S.

Needles—Latch.
Paulus, Chas. B.

Oils.
Hampden Paint & Chem. Co.
Wadsworth, Howland & Co., Inc.

Oils—Finishing
(See Finishing and Sizing Materials.)

Oils—Lubricating.
(See Lubricants.)

Oil Cups.
(See Lubricators.)

Oil Paper.
Bradley Mfg. Co., A. J.

Oil Tanks & Pumps.
Wayne Oil Tank & Pump Co.

Oil Testing Instruments.
Tagliabue Mfg. Co., C. J.

Oiling Devices.
(See Lubricators.)

Openers for Cotton, Wool, Waste Etc.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Organs.
Stieff, Inc., Chas. M.
Schofield Auto Music Co.

Oxidizing Machinery.
Phila. Drying Machinery Co.

Oxygen.
Commercial Acetylene Supply Co.
Linde Air Products Co.
Oxweld Acetylene Co.
Prest-O-Lite Co.
Standard Gas Products Co.
Waterhouse Welding Co.

Package Tying Machine.
Bunn & Co., B. H.

Packing Boxes & Cases (Wooden).
Hightower Box & Tank Co.
Walke Box Co., Inc.
Wall & Son, C. M.

Packings.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jenkins Bros.
Walraven Co.
U. S. Rubber Co.

Paint.
Atlanta Gas Light Co.
Barrett Co., The
Cooledge & Sons, F. J.
Du Pont de Nemours & Co., E. I.
Gulf States Creosoting Co.
Hampden Paint & Chem. Co.
High-Grade Mfg. Co.
Hurst Co.
Johnson Paint Co.
Peaslee-Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth, Howland & Co., Inc.

Paper.
Bradley Mfg. Co., A. J.
Diamond State Fibre Co.

Perforated Metal.
(See Screens and Sieves.)

Peroxides.
Roessler & Hasslacher Chemical Co.

Pianos & Players.
Scofield Auto Music Co.
Stieff, Chas. M.

Pickers—Curled Hair.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.

Pickers—Leather.
Garland Mfg. Co.

Picker Sticks.
Garland Mfg. Co

Picking Machinery.
Howard & Bullough, Am. Machine Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Pinions.
Diamond State Fibre Co.

Pipe and Pipe Fittings.
Crane Co.
Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walraven Co.

Pipe Organs.
Scofield Auto Music Co.

Pipe Threading & Cutting Machines.
Seeger Machine Tool Co.
Walraven Co., The

Playground Equipment.
Hill-Standard Co.
Medart Mfg Co., Fred.

Pool Tables, Etc.
Brunswick-Balke-Collender Co.

Power Transmission.
Aldrich Mch. Wks.
Allis-Chalmers Mfg. Co.
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
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Graton & Knight Mfg. Co.
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Ladew & Co., Inc., Edw. R.
Link-Belt Company.
Morse Chain Co.
Russell Mfg. Co.
S K F Industries.
Seeger Machine Tool Co.
Standard Pressed Steel Co.
Stanley Belting Corp.
U. S. Ball Bearing Co.
U. S. Rubber Co.
Valley Iron Works.
Walraven Co., The
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.

Presses.
American Laundry Machnry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Galland-Henning Mfg. Co.
Lovingood Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Seeger Machine Tool Co.
Smith & Furbush Mch. Co.
Textile Finishing Machinery Co., The

Pulleys.
Chicago Pulley & Shafting Co.
Cresson-Morris Co.
Diamond State Fibre Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Seeger Machine Tool Co.
Valley Iron Works.
Walraven Co., The

Pulley Covering.
Goodyear Tire & Rubber Co.
Stanley Belting Corp.
Williams & Sons, I. B.

Pumps.
Allis-Chalmers Mfg. Co.
Hughes Specialty Well Drilling Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Textile Finishing Machinery Co.
Toomey, Frank
Walraven Co.
Walsh & Weidner Boiler Co., The
Westinghouse Elec. & Mfg. Co.

Pump Oil).
Wayne Oil Tank &Pump Co.

Pump Valves.
(See Valve Discs.)

Psychrometers (Sling).
Taylor Instrument Co.

Pyrometers.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Quill Cleaning Machines.
Terrell Mch. Co.

Dufur & Co.

Receptacles (Fibre).
(See Fibre Products.)

Recording Instruments.
Powers Regulator Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Recorders (Draft).
Tagliabue Mfg. Co., C. J.

Recorders (Pressure).
Tagliabue Mfg. Co., C. J.

Recorders (Temperature).
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Reeds.
American Supply Co.
Emmons Loom Harness Co.

Reed Polishing Machines.
Shawmut Eng'g Co.

Reels.
Cocker Mch. & Fdry. Co.
Crompton & Kowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield, Wm. Co.
Whitin Machine Works.

Reflectors (Lamp).
(See Lamp Reflectors.)

Regulators (Condensate).
Tagliabue Mfg. Co., C. J.

Regulators (Liquid Level).
Tagliabue Mfg. Co., C. J.

Refrigerating Machines.
Southern States Supply Co.

Regulators—Pressure.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Regulators—Temperature.
(See Temperature Controllers.)

Regulators (Time).
Tagliabue Mfg. Co., C. J.

Reinforcement Bars for Concrete.
Corrugated Bar Co.

Repairing (Electrical).
Jones Mchry. Corp.

Repairing (Textile Mchry, etc).
Atlanta Welding Co.
Chattanooga Brazing & Welding Co.
General Machine Works.
Southern Spindle & Flyer Co.
Standard Gas Products Co.

Restaurant Equipment.
Chattanooga Queensware Co.
Reischmann Co.
Pick & Co., Albert
Wright Co.

Rib Top Cutters.
General Machine Works.
Wildman Mfg. Co.

Ring Travelers—Steel and Bronze.
Whitinsville Spining Ring Co.
Whitin Machine Works.

Rings—Spinning.
(See Spinning Rings.)

Rivets (Belt).
Crescent Belt Fastener Co.

Rocker Shaft Bearings.
(See Bearings.)

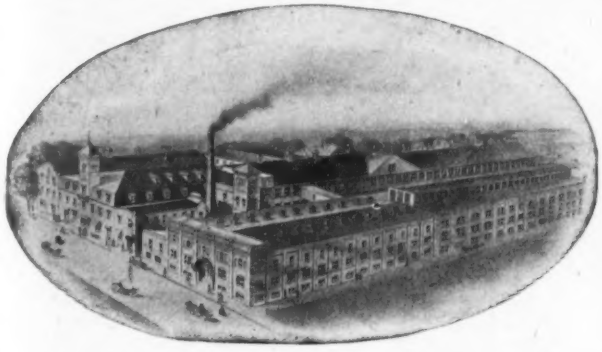
Rolls (Calender.)
Butterworth & Sons Co., H. W.
Perkins & Son, B. F.
Roy & Son Co., B. S.

Rolls (Rubber Covered).
American Wringer Co.
Butterworth & Sons Co., H. W.
Perkins & Son, B. F.

Rolls—Steel.
Butterworth & Sons Co., H. W.
Perkins & Son, B. F.
Southern Spindle & Flyer Co.

Roll Calendering Machine.
Simplex Roll Calendering Mch. Co.

Roofing.
Asphalt Roofing Co.
Atlanta Gas Light Co.
Barrett Co., The
Cooledge & Sons, F. J.
High-Grade Mfg. Co.



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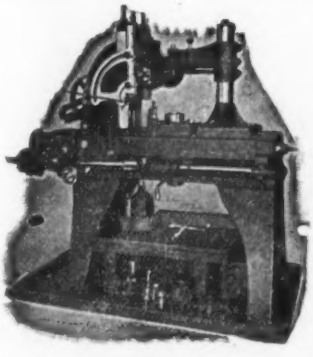

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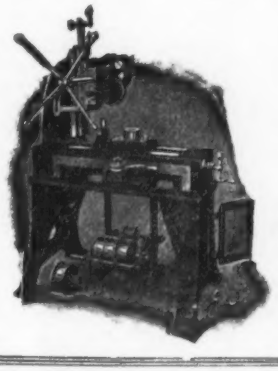

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PORTABLE MACHINERY CO., PASSAIC N.J.

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Johnson Paint Co.
Kirkpatrick Lum. & Timber Co.
Pesalee-Gaulbert Co., Inc.
Wadsworth, Howland & Co.
Walraven Co.

Roofing Felt and Pitch.
High-Grade Mfg. Co.

Roof and Cement Coating.
Asphalt Roofing Co.
Barrett Co.
Cooledge & Sons, F. J.
Du Pont de Nemours & Co., E. I.
Hampden Paint & Chemical Co.
High-Grade Mfg. Co.
Hurst Co.
Johnson Paint Co.
Pesalee-Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth, Howland & Co.

Rope—Transmission.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Walraven Co.

Roving Cans and Trucks.
(See Cans—Roving.)

Roving Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Rubber Stamps.
(See Stamps, Stencils, Etc.)

Rubber Goods.
Goodyear Tire & Rubber Co.
U. S. Rubber Co.

Sanitary Products.
Chattanooga Queensware Co.
Crane Co.
Dail Steel Products Co.
Hackney Bros. Co.
Kaustine Co.
Rundle-Spence Mfg. Co.
United Electric Co.
Vogel Co., Jos. A.

Sash-Window—Steel.
Detroit Steel Products Co.
Lupton's Sons Co., David

Scales.
American Kron Scale Co.
Lovingood Co.
Torsion Balance Co.

Scale Preventer (Boiler).
(See Boiler Feed Water Purification.)

Screens & Sieves—Perforated.
Erdle Perforating Co.
Link-Belt Company.

Scrubbing Machine—Floor.
American Scrubbing Mch. Co.

Second Hand Machinery & Supplies.
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
Toomey, Frank, Inc.
Unchurch, C. L.
Walraven Co.

Sewing Machines.
Merrow Machine Co., The
Textile Finishing Mchy. Co.
Wilcox & Gibbs Sewing Mach. Co.

Shades (Electric Lamp).
(See Reflectors).

Shafting & Hangers.
Chicago Pulley & Shafting Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Co.
Seeger Machine Tool Co.
S K F Industries.
Standard Pressed Steel Co.
Valley Iron Works.
Walraven Co., The

Shears.
Roy & Son Co., B. S.

Shelving—Sectional Steel.
Collins, J. D.
Hyatt Roller Bearing Co.
Lupton's Sons Co., David
Medart Mfg. Co., Fred.

Shingles—Asphalt.
Barrett Co.

Shingles—Metal.
Cortright Metal Roofing Co.

Shingle (Wood).
Kirkpatrick Lum. & Timber Co.
Southern Cypress Mfg. Asso.

Shipping Room Machinery and Supplies.
Acme Steel Goods Co.
American Kron Scale Co.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Bunn & Co., B. M.
Collins, J. D.
Diamond State Fibre Co.
Elwell-Parker Elec. Co.
Handy Equip. Corp.
Hightower Box & Tank Co.
Hulme, J. S.
Keystone Fibre Co.
Lane & Bro., W. T.
Lovingood Co.
McKinney Mfg. Co.
Regnas & Co., J. R.
Rogers Fibre Co.
Standard Fibre Co.
Seeger Machine Tool Co.
Signode System, Inc.
Torsion Balance Co.
Walraven Co., The
Walke Box Co., Inc.
Wall & Son, C. M.

Shower Baths.
Crane Co.

Shuttles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Shambow Shuttle Co.

Sinkers.
Paulus, Chas. B.

Singeing Machinery.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The

Size Box Temperature Controller.
Powers Regulator Co.
Taylor Instrument Co.
Tagliabue Mfg. Co., C. J.

Size Kettles.
Butterworth, H. W. & Sons Co.
Howard & Bullough, American Machine Co.
Lombard Iron Works & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The

Sizing and Finishing Compounds.
(See Finishing & Sizing Materials.)

Skewers.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.

Skylights—Steel.
Detroit Steel Products Co.
Lupton's Sons, Co., David

Slashers and Slasher Room Supplies.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Howard & Bullough.
Lovingood Co.
Mossberg Co., Frank
Regnas & Co., J. R.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The

Slasher Tape.
(See Tape—Slasher.)

Slate Asphalt Roofing.
Barrett Co.

Sliding Partition Hardware.
Richards-Wilcox Mfg. Co.

Slubbers.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Soap—Textile.
Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Dobbins Soap Mfg. Co.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Alum. Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Hemingway & Co., Frank
Klipstein & Co., A.
Newport Chemical Works.
Pick & Co., Albert
United Chemical Products Corp.
Warren Soap & Mfg. Co.
Wolf & Co., Jacques
World Mfg. Co.

Soda Ash.
Klipstein & Co., A.

Softeners—Cotton.
Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Borne, Schrymser Co.
Bosson & Lane.
Dow Chemical Co.
Durex Chemical Co.
Du Pont de Nemours & Co., E. I.
Grasselli Chemical Co.
Hemingway & Co., Frank
Kali Mfg. Co.
Klipstein & Co., A.
Moore Oil Refining Co.
Newport Chemical Works.
National Oil Products Co.
Pick & Co., Albert
Roessler & Hasslacher Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques
World Mfg. Co.

Softeners—Water.
(See Water Softeners.)

Solderless Connectors (Franked.)
Westinghouse Elec. & Mfg. Co.

Solvents.
(See Finishing.)

Sorting Table Tops.
Pick & Co., Albert

Spindles.
Allen Spindle Corp.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Spindles—Ball Bearing.
Allen Spindle Corp.

Spinners.
Arlington Cotton Mills.
Arrow Mills, Inc.
Flint Mfg. Co.
Gray Mfg. Co.
Hunter Mg. & Comm. Co.
King Cotton Mills Corp.
Myrtle Mills, Inc.
Parkdale Mills, Inc.

Spinning Frames.
American Machine Co., H. & B.
Crompton & Knowles Loom Wks
Fletcher Works.
Florsheim, H. A.
Howard & Bullough.
Schaum & Uhlinger.
Saco-Lowell Shops.
Whitin Machine Works.

Spinning Rings.
Allen Spindle Corp.
Draper Corporation.
Howard & Bullough.
Greenville Spool & Mfg. Co.
Southern Novelty Co.
Whitin Machine Wks.
Whitinsville Spinning Ring Co

Spinning Tape Specialists.
American Textile Banding Co. Inc.
Barber Mfg. Co.

Spooling Machinery.
Draper Corporation.
Greenville Spool & Mfg. Co.
Saco-Lowell Shops.
Smith & Furbush Machine Co.
Whitin Machine Works.

Spools & Skewers.
Greenville Spool & Mfg. Co.

Sprinkler Tanks.
(See Tanks, Towers, Etc.)

Sprockets.
Link-Belt Company.
Morse Chain Co.
Valley Iron Works.

Stamping (Dye Transfer System).
Kaumagraph Co.

Stamps, Stencils and Stencil Machines.
Atlanta Stamp & Stencil Works
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.
Southern Stamp & Stencil Co.

Stand Pipes.
(See Tanks, Towers, Etc.)

Starch & Gums.
(See Finishing and Sizing Materials.)

Steam Engines.
(See Engines—Steam.)

Steam Hose.
(See Hose—Steam.)

Steam Pumps.
(See Pumps—Steam.)

Steam Traps.
(See Traps—Steam.)

Steel Doors, Window, Partition, Etc.
Detroit Steel Products Co.
Lupton's Sons Co., David

Steel Lockers.
(See Lockers.)

Stencils & Stencil Papers.
(See Stamps and Stencils.)

Stencil Brushes.
(See Marking Pots and Brushes.)

Stencil Cutting Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.
Southern Stamp & Stencil Wks

Stop Motion.
Crompton & Knowles Loom Wks.
Draper Corporation.
Wildman Mfg. Co.

Storage Batteries.
Edison Storage Battery Co.

Storage Racks
(See Shelving)

Storage Tanks for Oil and Gasoline
Wayne Oil Tank & Pump Co.

Strapping.
(See Leather Specialties or Bar Strapping.)

Street Lighting Fixtures.
Cutter Co., George.

Supplies (General Mill).
Crymes Mchry. & Supply Co.
Hulme, J. S.
Jones Mchry. Corp.
Mill Supply Co. of Greenville.
Regnas & Co., J. R.
Seeger Machine Tool Co.
Steel Heddle Mfg. Co.
Walraven Co., The

Switches (Knife-Elec.).
Crouse-Hinds Co.
Cutter Co., George.

Switchboards (Panel).
Crouse-Hinds Co.
Cutter Co., George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Tables, Chairs, Etc.
Hill-Standard Co.
Pick & Co., Albert
Reischmann Co.
Wright Co.

Tachometers.
Tagliabue Mfg. Co.
Veeder Mfg. Co.

Tag Addressing Machines.
Regnas & Co., J. R.

Tallow.
(See Finishing Materials.)

Tanks and Tubs.
Hightower Box & Tank Co.
Lombard Iron Works & Supply Co.
Permutit Co.
Phila. Drying Machinery Co.
Textile Finishing Machinery Co., The
Walsh & Weidner Boiler Co.

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Barber Mfg. Co.
Weimar Brothers.

Tape Looms—Cotton.
Fletcher Works.
Schaum & Uhlinger.

Tape—Slasher.
Lovingood Co.
Regnas & Co., J. R.

Tape Making Machines.
(See Bandage and Tape Mach.)

Telephones (Calling System.)
Carter Elec. Co.
Dixie Elec. Equip. Co.

Temperature Controllers.
Carrier Eng. Corp.
Parks-Cramer Co.
Powers Regulator Co.
Sturtevant Co., B. F.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Temples.
Draper Corporation.

Tenring Machines.
Collins, J. D.
General Utilities Co.
Lovingood Co.
Regnas & Co., J. R.

Tenters.
Butterworth & Sons Co., The
Textile Finishing Mach. Co.

Textile Machinery.
(See Cotton Mill Machinery.)

Textile Schools.
(See Schools.)

Theatre Equipment.
Lucas Theatre Supply Co.
Rothacker Film Mfg. Co.
Southern Theatre Equip. Co.

Thermometers—All Kinds.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Thin Place Preventers.
Draper Corporation.

Thread Guides.
Mitchell-Bissell Co.
Palmer Co., The I. E.

Ties (Baling).
(See Bale Ties.)

Time Clocks.
International Time Recorder Co.

Tires—Auto and Truck.
Goodyear Tire & Rubber Co.
U. S. Rubber Co.

Toilets.
Crane Co.
Dail Steel Products Co.
Kaustine Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Tools (All Kinds.)
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
Pasco Tool Co.
Seeger Machine Tool Co.
Walraven Co., The

Towers.
(See Tanks and Towers.)

Tractors—Electric, Industrial.
Collins, J. D.
Elwell Parker Elec. Co.
Regnas & Co., J. R.

Transmission—Power.
(See Power Transmission Machinery.)

Transfer Points.
Adams Co., Geo. H.

Traps—Return Steam.
American Blower Co.
Morehead Mfg. Co.

Trucks—Auto.
Corbitt Motor Truck Co.
Packard Motor Car Co.
Triangle Motor Truck Co.
White Co., The
White Hickory Motor Corp.

Trucks, Canvas.
Lane & Bro., W. T.

Trucks—Electric—Inter
Collins, J. D.
Elwell-Parker Electric Co.
Regnas & Co., J. R.

Trucks—Hand & Elevating.
Collins, J. D.
Elwell-Parker Elec. Co.
Handy Equip. Corp.
Hulme, J. S.
Lovingood Co.
McKinney Mfg. Co.
Regnas & Co., J. R.

Trucks (One Man).
Handy Equip. Corp.
McKinney Mfg. Co.

Trucks—Fibre—Inter, Etc.
Diamond State Fibre Co.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.

Tubes (Cloth).
Diamond State Fibre Co.

Turbines—Steam.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Twisting Machinery.
Allen Spindle Corp.
Draper Corporation.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.

Whitin Machine Works.

Tying Machine (Package, etc.).
Bunn & Co., B. H.

Urinals.
Crane Co.
Dail Steel Products Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Unions—Bronze.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Vacuum Cleaning System for Mills.
United Electric Co.

Vacuum Pans.
Cresson-Morris Co.

Valves—Angle, Globe and Cross.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Blow-Off.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Check.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Gate.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Non-return Stop.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Pop-Safety.
Jenkins Bros.
Lunkenheimer Co.

Valve Discs.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jenkins Bros.

Varnishes.
Barrett Co.
Cooledge & Sons, F. J.
Du Pont de Nemours & Co., E. I.
Hampden Paint & Chem. Co.
Hurst Co.
Johnson Paint Co.
Peaslee Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth, Howland & Co., Inc.

Ventilating Apparatus.
American Blower Co.
Carlyle & Gale Co.
Carrier Eng. Corp.
General Electric Co.
New York Blower Co.
Parks Cramer Co.
Perkins & Son, Inc., B. F.
Sargent's Sons Co., C. G.
Sturtevant Co., B. F
Tolhurst Mch. Co.

Vises and Benches.
Richards-Wilcox Mfg. Co.

Village Architects and Designers.
Draper, E. S.
Lockwood Greene & Co.
Sirrine, J. E.
Tuxbury Lumber Co., A. C.

Wagon and Car Unloaders.
Portable Machinery Co.

Warehouse (Storage).
Burg Line Agency.

Warehouse Door Hardware.
Richards-Wilcox Mfg. Co.

Warp Drawing Machines.
Cocker Machine & Fdy. Co.
Crompton & Knowles Loom Wks.

Warpers and Warping Machinery.
Cocker Mch. & Fdry. Co.
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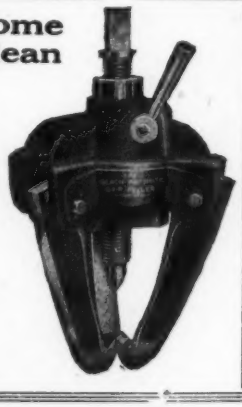

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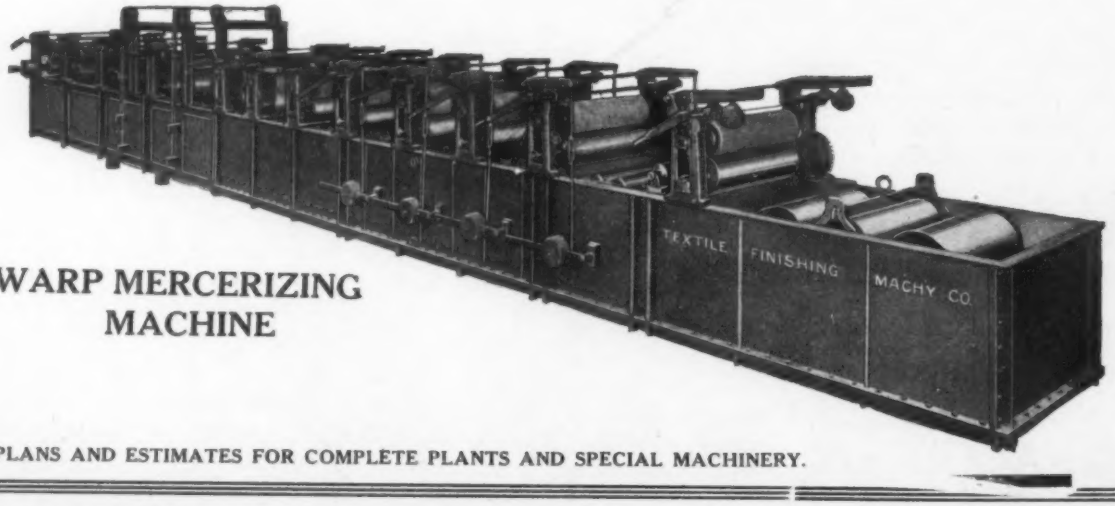

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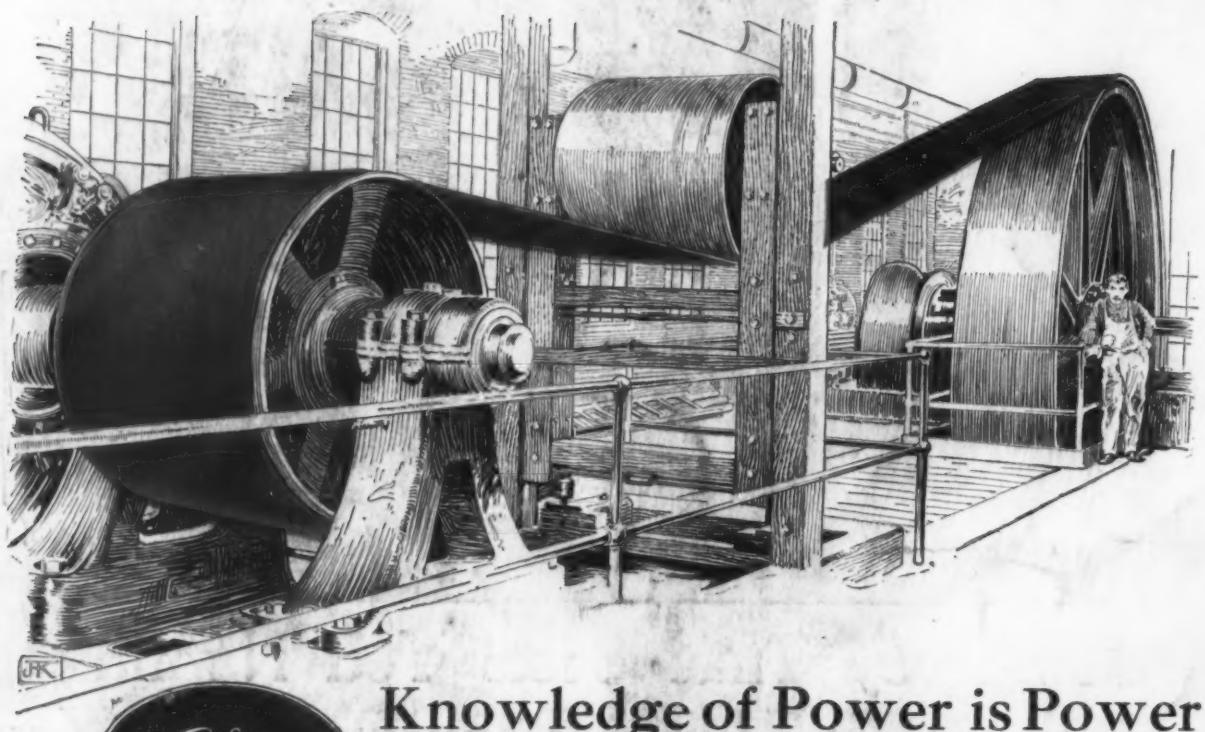

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